FLIGHT

MAGAZINE

MARCH 1961

50 cents

6 MAR 21 1961
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TANDEM-ENGINE CESSNA SKYMASTER TWIN

(See page 13)

One of the outstanding features of this four-place airplane is . . .

BELLANCA *Performance*

- **203 MILES PER HOUR**
  (Cruise speed 75% power-9,000 feet)
- **49 m.p.h. LANDING SPEED**
- **1,750 f.p.m. RATE OF CLIMB**
- **22,000 ft. SERVICE CEILING**
- **880 mi. RANGE**
  (Maximum range with 60 gal. fuel-65% power)

Our free booklet will answer your questions about the high-performance airplane which, in keeping with the Bellanca record of achievement in performance, safety and flight characteristics, broke the 200 mph. speed barrier for aircraft under $20,000.

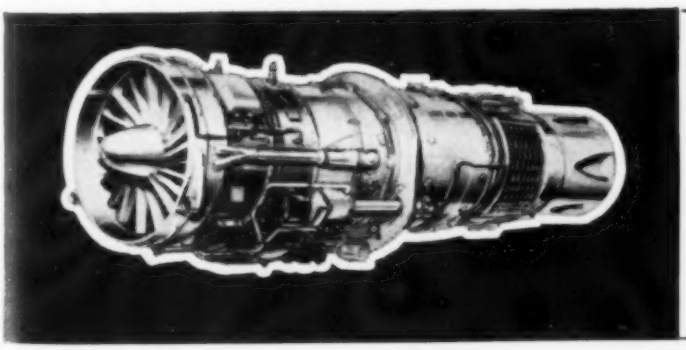
DOWNER AIRCRAFT COMPANY • **Alexandria, Minnesota**

POWERED BY ROLLS-ROYCE

de HAVILLAND TRIDENT

SPEY

BY-PASS TURBO JETS



The Spey by-pass jet has been specifically designed to give the best possible operating economics for the second generation of short to medium range jet transports.

ROLLS-ROYCE OF CANADA LIMITED, BOX 1400, ST. LAURENT, MONTREAL 9, P. Q.

ROLLS-ROYCE LIMITED, DERBY, ENGLAND

AERO ENGINES • MOTOR CARS • DIESEL AND GASOLINE ENGINES • ROCKET MOTORS • NUCLEAR PROPULSION

Heading up the operation at Four Corners—*(left)* Jack Roberts, President, and *(right)* Tom Buress, Sec.-Treasurer.

Rocky Mountain Haven at Four Corners

Four Corners Aviation, Inc., at Municipal Airport, Farmington, New Mexico. Flight office and lounge are on the right.

The pilot's lounge at Four Corners . . . free coffee, friendly people, and lots of "hangar talk".

Mobile refueling is prompt and efficient. Clean windshields and an alert "walk-around" are S.O.P.

Located near the junction of Utah, Colorado, New Mexico, and Arizona, Four Corners Aviation is home base for some 88 fliers from four states. The transient business is brisk also, lured by almost continuous CAVU weather, winter and summer vacation facilities, and a booming economy . . . oil, gas, uranium, sheep, cattle, and truck farming.

At an elevation of 5500 feet, Farmington's Municipal Airport boasts three first-class runways (longest is 6800 feet), border lights, FAA Radio and Weather, and an Omni station. The service at Four Corners is first-class, too—24-hour mobile refueling with high performance Phillips *66* Aviation Gasoline (80 and 100 octane), tie-downs, hangars, certified A&E maintenance and overhaul, and a pleasant lounge where the coffee is always on. Four Corners, a Cessna Dealer, also offers flight and ground instruction . . . as well as single- and multi-engine charter.

For overnighters there's a fine restaurant at the new air terminal . . . car rentals . . . with motels and town less than a mile away.

• • •

New HD Oils . . . For Longer Engine Life

Never before could an aircraft oil promise so much! With improved additives, new Phillips 66 Aviation HD Oils provide top protection against pre-ignition, plug fouling, ring sticking and valve burning . . . keep engines cleaner for longer life, maximum in-flight reliability, and lower operating costs. Phillips 66 HD Oils meet Continental and Lycoming specifications.

AVIATION DIVISION • PHILLIPS PETROLEUM COMPANY • BARTLESVILLE, OKLAHOMA

PHILLIPS 66

AIR Report
Significant Trends and News

SLOWDOWN IN LIGHTPLANE SALES during hard-winter conditions in February reflects readjustments from high-volume September-January deliveries and inventory build-up caused production cuts until intensified sales efforts can restore volume. Quick action by factories and dealers will minimize slowdown's effects and Spring-Summer outlook is good. Sales of parts, service and fuel are steadily increasing as business use of lightplanes is stepped up.

TEMCO WILL PRODUCE 2-PL. AEROCAR FLYING AUTO for Aerocar International Corp. of Ft. Worth on a contract based on receipt of sufficient firm orders prior to July 1, 1961, from Aerocar International. Roy Hyde of Fort Worth is president of Aerocar International and Molt Taylor of Longview, Wash., is vice president-engineering. Deal was announced by Temco Missiles & Aircraft of Dallas. Hyde said he's confident sufficient production will be ordered in time for output late in 1961. He plans sales through 21 distributors and 772 dealers for the 2-place, 143-hp., fluid-drive, 4-wheeled pusher-type Aerocar, already FAA certificated with over 1,000 flight hrs. and 100,000 road miles. As a plane, it cruises 100 mph. for 300-mi. range and lands and takes off within 650 ft. at 50 mph. Converted by one person in 10 mins. to auto, it travels up to 60 mph. on road for 300 mi.

RECORD-HIGH ORDERS FOR AERO COMMANDERS were received by the manufacturer during February. Without giving numbers, Col. W. F. Rockwell, chairman of Aero Commander, Inc., said the orders were the highest for one month in almost three years and point the way toward improved sales for the balance of 1961. In almost every instance, the orders represent firm purchase commitments from corporate users, he said.

EXPORT SALES OF PIPER AIRCRAFT totaled over $6 million during Piper's fiscal 1960 year, an increase of 108% over the previous year. J. W. Miller, general sales manager, said Piper exported 539 lightplanes to 58 different countries. Ninety-eight per cent of the twin-engine models were flown to their destinations, with an Apache flying to Thailand and two Aztecs flying to Australia for the longest flights, and 60% of the single-engine Comanches going abroad were flown, including 31 which crossed the Atlantic. Virtually all exports to South America were flown, a pair of Pawnees flying 7,000 miles to Argentina. Many Pawnees and Super Cubs flew nonstop from Miami across the Caribbean with auxiliary fuel in their chemical hopper tanks.

PRODUCTION OF 10 TWO-PLACE AIRCRAFT PER MONTH has been scheduled by Shinn Engineering, Inc., at a new 20,000-sq. ft. manufacturing facility in Santa Ana, California, at 320 Dyer Road. Shinn will produce the 150-hp., 2-place Morrisey 2150 low-wing, tandem-seat, tricycle-gear lightplane, hereafter to be called the Shinn 2150-A. Clifford Shinn, president, said he had named Bob Follett as sales manager. He was formerly national sales manager of Narmco-Conolin Sporting Goods.

NEW ROUND-THE-WORLD SPEED RECORD FOR PISTON-POWERED AIRPLANES was sought early in March by Max Conrad, America's foremost distance pilot, when he began a 25,457-mile global circuit in a Piper Aztec Twin. His take-off was from Miami with the following itinerary: Miami-Long Beach, 2,326.1 miles; Long Beach-Honolulu, 2,568.1 miles; Honolulu-Wake, 2,300.5 miles; Wake-Manila, 3,028.6 miles; Manila-Singapore, 1,480 miles; Singapore-Bombay, 2,432.7 miles; Bombay-Nairobi, 2,821.4 miles; Nairobi-Lagos, 2,382.2 miles; Lagos-Dakar, 1,522.9 miles; Dakar-Trinidad, 2,969.2 miles, and Trinidad-Miami, 1,625.2 miles. This routing exceeds the 24,903-mile circumference of the earth at the Equator and is the first record flight planned for such a distance. He hoped to complete the circuit in 9 days.

FIRST FLIGHT OF AN AMERICAN ALL-GLASS-FIBER HELICOPTER ROTOR BLADE was made re-

FLIGHT MAGAZINE

MARCH, 1961 VOL. 50, No. 3

THIS MONTH'S COVER is the first photograph released by Cessna Aircraft Company showing its radically-designed new tandem-engine twin taking off on its first flight on Feb. 28, 1961, at Wichita. Called the "Skymaster," it was designed to eliminate need for multi-engine rating.
—(Cessna Photo.)

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GEORGE E. HADDAWAY, Editor-Publisher; TOM ASHLEY, Managing Editor; FRED N. STONES, JR., Business Manager; LOUISE ROBERTSON, Circulation; E. H. PICKERING, Consultant; P. O. Box 750 (2700 N. Haskell Ave.), Dallas, Texas — Telephone TAylor 3-6191.

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Speeds up to 230 mph make the new Beechcraft Baron a real "get there in a hurry" airplane. It can carry 5 big people and their baggage over 1,000 miles non-stop and still have a fuel reserve. Yet it's amazingly easy to fly.

New Continental 260 hp fuel injection engines give you more power, easier starting in any weather, precise fuel metering for extra fuel economy—plus complete freedom from carburetor icing.

Big "flight-planned" panel has instruments and controls located for maximum convenience. There's plenty of room, too, for extra nav-com equipment.

All-New Beechcraft Baron... Fast, Sleek, Roomy!

No matter how you compare the exciting new Beechcraft Model 55 Baron with other business twins in its size and power class, it doesn't take you long to realize that this airplane simply has no equal among its competitors.

Take speed, for example. The Baron has a wide choice of power settings for speeds up to 230 mph. How about range? The Baron can fly over 1,200 miles non-stop and still have a fuel reserve. What about useful load? The new Baron can carry 1,920 pounds of fuel, passengers, baggage and equipment. And, even at full gross weight, it can clear a 50-ft. obstacle on take-off in 1,255 ft.!

Inside, the Baron has room for 5 big people to relax in typical Beechcraft comfort in individually reclining seats. Naturally, there's plenty of headroom, hiproom and legroom. Super soundproofing makes conversation easy. Big ultra-violet windshield and huge oversized windows give you unmatched visibility on the ground or in the air.

A new ventilation system and big 50,000 BTU heating system lets you tailor-make your climate as you go. And, like all Beechcrafts, the Baron is ruggedly built to give you extra years of reliable, low-cost operation.

But the best way to evaluate the new Beechcraft Baron is to accept the invitation of Beechcraft distributors and dealers to see and fly this airplane yourself. Why not make arrangements now to be among the first pilots in your area to fly the new Beechcraft Baron.

Write today for latest information on low-cost Beech leasing and financing plans. Address: Beech Acceptance Corp., Wichita 1, Kansas, U. S. A.

Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Fly the new dual-control Twin-Bonanza. New flight panel arrangement has radios, instruments, radar ideally work-located.

Look at all this space for 6 big people. Plenty of room for luggage at rear of passenger cabin, where it's accessible in flight.

Quickly off and away, even when fully loaded, with 2 big 340 hp supercharged Lycoming fuel injection engines and high-lift wing design!

For Bigger Work Loads... Beechcraft Twin-Bonanza!

If you want a better airplane to help carry a bigger work load, your choice will be an easy one—once you have seen and flown the new Beechcraft Twin-Bonanza.

It's easy to walk right in, up the fold-away "air stair" door. Inside, you stow your luggage at the rear of the Twin-Bonanza's spacious cabin. Walk up the wide center aisle to your seat. There's plenty of room for 6 big people, with headroom, legroom and hiproom for all, a sky-wide view around you, and super-soundproofing for amazing quiet.

Famous the world over as the strongest, most rugged airplane in commercial aviation, the Twin-Bonanza's extra strength and reliability assure you of more trouble-free hours of use.

Up front, settle into the pilot's seat and notice the ideal, sensible arrangement of everything you need to work with. Stretch your legs. Adjust your chair. Controls are right at your fingertips.

Now, fly it. See how quickly and quietly you're airborne. See how easily you climb—even fully loaded! Level off for a smooth, stable ride. Speed? This airplane's got it—up to 235 mph if you need it. Range, with reserve, is over 1,325 miles.

Plan to check-fly the Twin-Bonanza yourself, soon. Beechcraft distributors and dealers are waiting for your call. Why not phone now and arrange it?

Write today for latest information on low-cost Beech financing and leasing plans. Address Beech Acceptance Corp., Wichita 1, Kansas, U. S. A.

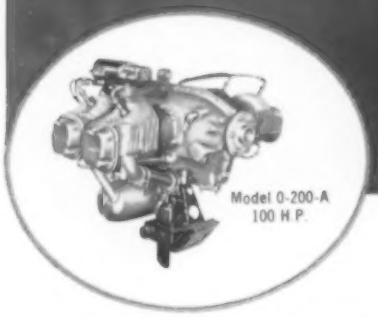
Beechcraft

BEECHCRAFTS ARE THE AIR FLEET OF AMERICAN BUSINESS

Faithful as Your Shadow . . .

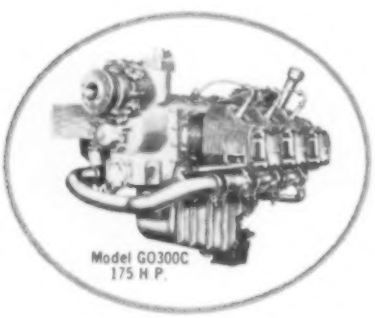
CONTINENTAL WORLDWIDE SERVICE

. . . Is Right There, Wherever You Fly!

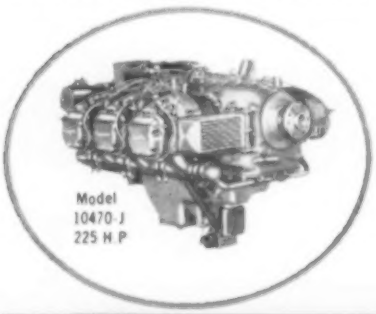


Model 0-200-A
100 H.P.

One reason why users of business aircraft show such decided preference for planes with Continental power is the elaborate set-up maintained by Continental Motors to keep such aircraft in the air at lowest cost. Owners know that no matter where they fly —north, south, east or west—there's established Continental service—genuine parts and competent mechanics—close at hand. When it comes to choosing a plane that must pay its way as a business tool, the confidence born of that knowledge is a factor second in importance only to engine dependability itself.



Model GO300C
175 H.P.



Model
10470-J
225 H.P.

The men and machines that built your engine originally are best qualified to restore it to like-new condition. Continental's Factory Re-Manufacture backs you with factory knowhow, and precision production machinery, throughout your engine's life. Write for information.

Continental Motors Corporation
AIRCRAFT ENGINE DIVISION
MUSKEGON • MICHIGAN

cently by Kaman Aircraft Corp. on a Kaman H-43 helicopter at Bloomfield, Conn. Kaman began research on the new blade in 1952. Its entire structure is composed of load-oriented glass filaments, precision molded in a modified epoxy resin. Kaman says it represents a significant improvement in blade fatigue resistance, makes possible major savings in manufacturing and maintenance costs and eliminates corrosion and weathering problems.

MANDATORY REPORTING OF NAVIGATION AND COMMUNICATIONS EQUIPMENT MALFUNCTIONS is required by a new special CAR regulation issued by the FAA

(Continued on page 44)

Airmen's Calendar

March 16-18—5th National Conference on Aviation Education, Mayflower Hotel, Washington, D. C.

March 17—Texas Private Fliers Association Flight to Mazatlan, Mexico, Decima Hotel, Headquarters.

March 28-29—Nucleonics in Flight Symposium, American Nuclear Society, Statler Hilton Hotel, Dallas.

April 4-5—Aviation Technician School Administrators Conference, Purdue University, Lafayette, Ind.

April 15-16—Northern California showing of 1961 Cessna Line, Nut Tree Inn Airpark, Vacaville, California.

April 22-25—34h Annual Business Meeting, American Association of Airport Executives, Broadmoor Hotel, Colorado Springs.

April 27-29—1961 National Intercollegiate Flying Association's 13th Annual Air Meet and Conference, Texas A. & M. College, College Station, Texas.

April 30-May 6—1961 Annual Aviation/Space Writers Association Annual Meeting and News Conference, Commodore Hotel, New York City.

May 3-5—17th Annual National Forum, American Helicopter Society, Sheraton Park Hotel, Washington, D. C.

May 12-14—1961 Mid-America Air Fair, Wichita, Kansas.

May 15-18—20th National Conference of the Society of Aeronautical Weight Engineers, Sheraton Hotel, Akron, Ohio.

May 26-June 4—24th International Air Show, LeBourget Airfield, Paris, France.

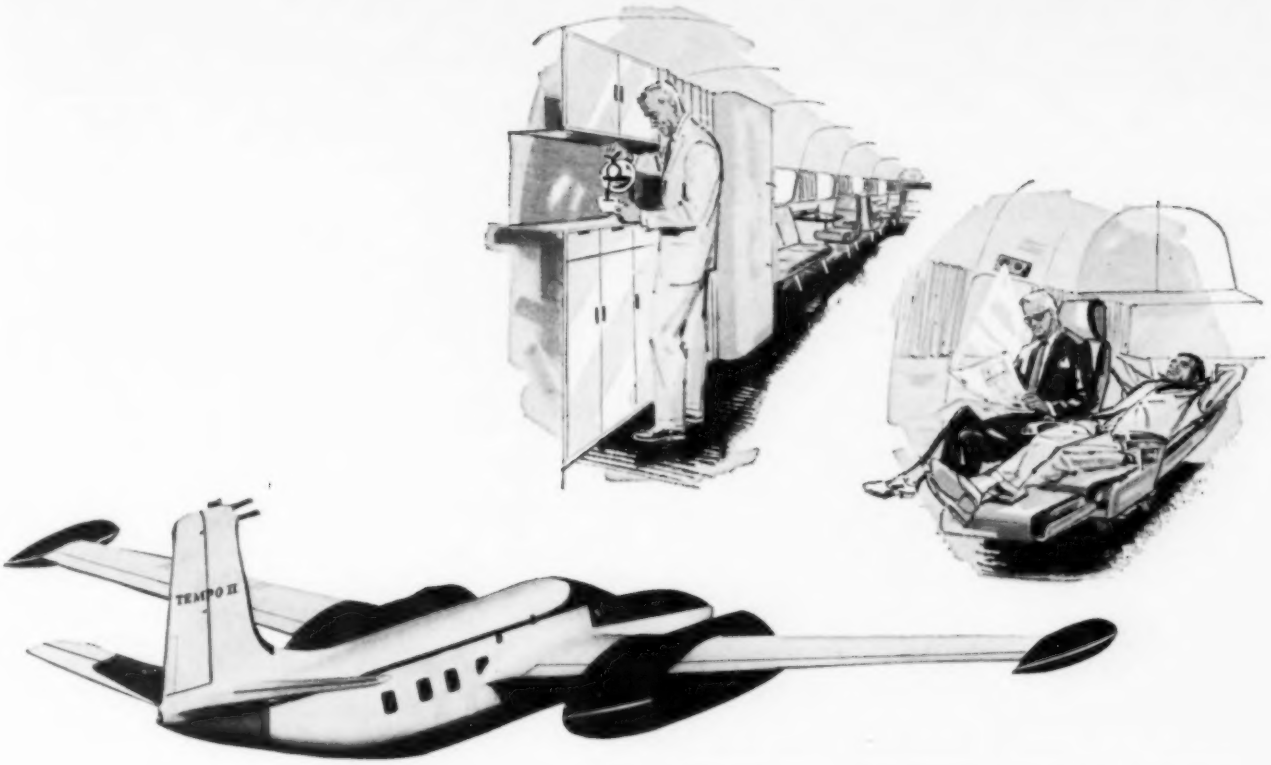
May 27—11th All Women's International Air Race, Lehigh Acres, Florida, to Nassau, BWI. For details, write Mary Barrer.

June 13-15—37th Aviation Distributors and Manufacturers Association Meeting, Dennis Hotel, Atlantic City, New Jersey.

June 18—Dawn Patrol, Haines Airport, Three Rivers, Michigan.

June 26-27—1st Annual Flying Osteopathic Physicians Association Meeting, Broadmoor Hotel, Colorado Springs.

June 28-July 1—Institute of Navigation Annual Meeting, Williamsburg Inn, Williamsburg, Virginia.



TEMPO II

...MAN SIZE, PRESSURIZED, CUSTOMIZED LARGER-BY-FAR THAN ANY OTHER BUSINESS TRANSPORT IN ITS CATEGORY

HEAD-ROOM . . . Six feet two inches of head-room in the passenger cabin extends up to and into the cockpit . . . Neither stooping nor crawling is required by the passengers or pilots in the Tempo II interior.

WALK-ROOM . . . The new, longer-by-far Tempo II cabin has a clear, walk-thru aisleway extending twenty-six feet two inches from the cockpit to the rearmost passenger seat.

LEG-ROOM . . . The entire, man size, custom tailored interior is designed to provide the roominess necessary for work or relaxation . . . An uncluttered, ten passenger Executive cabin is achieved by locating the full complement galley and full height lavatory aft of the cockpit and forward of the main cabin.

COMFORT-ROOM . . . Both passengers and crew have the space to be comfortable in the pressurized, larger-by-far interiors of Tempo II . . . Airline proven pressurization, permitting above weather, smooth-air flights, is combined with centrally controlled air conditioning and cabin heating to add to the comfort and convenience found only in the high performance Tempo II.

The high speed, high performance Tempo II, in addition to being larger than any aircraft in its category, is the only Executive version of the famous Douglas B-26 that can be delivered with an Aircraft Flight Manual, approved under CAR Part 4b formula.

A detailed description of the man size, exclusive Tempo II and an analysis of its performance are available on request.

L. B. SMITH AIRCRAFT CORPORATION
INTERNATIONAL AIRPORT • MIAMI • FLORIDA

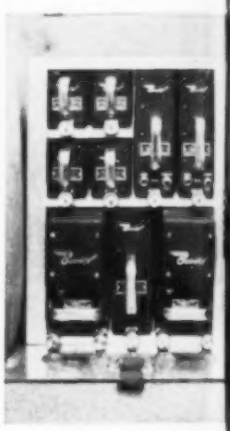
"Gives us exactly the reliability and low maintenance cost we want"

FOREST BECKETT, PRESIDENT, YOUNGSTOWN AIRWAYS

As an operator of large fleets since 1944—and present owner of an executive fleet of 42 aircraft, the world's largest—Mr. Beckett knows whereof he speaks. Which is why he specifies Bendix® dual VHF Comm/Nav systems for his Twin-Beech Model 50's. It is actually the same equipment that would be used on a DC-8, 707, or 880.

Most business aircraft operators agree the chief reasons for the Bendix system's popularity are these: high degree of reliability, unusually low maintenance cost, and reduced size and weight.

When you're in the market for Comm/Nav equipment, find out for yourself why Bendix is your best buy. See your local Bendix dealer. Or write Bendix Radio Division, Avionic Products, Baltimore 4, Maryland.



EVEN IN SMALLER AIRCRAFT, like the Beech Bonanza, the Bendix Comm/Nav System fits to perfection. This is TSO'd equipment: crystal-controlled, 50-kc channel spacing, 25-watt transmitter output, 0.5° bearing accuracy on NAV function.

World's largest executive fleet depends on Bendix comm/nav

Bendix Radio Division

AVIONIC PRODUCTS • BALTIMORE 4, MARYLAND

THE Bendix CORPORATION

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WEST COAST: Bendix Radio Division, 10500 Magnolia Boulevard, N. Hollywood, Calif.
CANADA: Computing Devices of Canada, Ltd., Box 508, Ottawa 4, Ontario

NEW 90-GALLON

FUEL CAPACITY gives the new 1961 Comanche 250 over 1100-mile range at maximum cruising speed; over 1600 miles (12 hours) at economy cruise. Two optional 15-gallon internal wing tanks supplement standard 60-gallon capacity without taking up baggage space. No plane in its class matches the Comanche's fuel capacity, or provides such a safe fuel reserve. Comanche 250 is now approved for 100-pound increase in gross weight, too.

NEW PANEL WITH CENTER-MOUNTED RADIOS accommodates full IFR flight instruments plus 2½ comm/nav system including 2 VHF transmitters, 3 VHF receivers, 2 VOR/ILS LOC systems plus Piper AutoNav radio compass or ADF—and there's room left over!

NEW DUAL BRAKING SYSTEM offered exclusively as standard equipment. Provides individual toe brakes for left seat pilot plus handbrake accessible to either front seat occupant.

ALL THESE SUPERIOR COMANCHE FEATURES

EXCLUSIVE STABILATOR reduces drag 25%, increases stability, provides better low-speed control. Much imitated swept rudder adds eye-catching beauty.

ROOMIEST BAGGAGE COMPARTMENT in its class. With 20" x 20" door, 20 cubic-foot capacity, Comanche easily loads, carries up to 200 lbs. of luggage.

LARGE NOSE WHEEL, same size as main wheels, lets Comanche operate from rough, soft fields with greater safety than other airplanes in the same class.

ADJUSTABLE, RECLINING SEATS, just one of many superior comfort features of the Comanche's cabin, roomiest by far of any airplane in its class.

GIVE YOU THE BEST BUY EVER

Fly the Leader
Fly the Comanche
180 or 250 hp

See the 1961 Comanche at your Piper dealer's
or write for Comanche brochure, Dept. F-3, **PIPER Aircraft Corp., Lock Haven, Pa.**

SALUTE!

To Our Teammates on the Supply Line

EXECUTIVE AIRCRAFT CO., INC., Municipal Airport, Kansas City, Mo.

Familiar Welcome Mat For Private And Business Flyers

SALUTE! Big, bustling Executive Aircraft – Cessna distributor and around-the-clock service center for business airplanes of every type and size – for nine years has been a favorite of pilots throughout America's winged Midwest. Founder-President Virgil W. Hackett, a former Cessna Aircraft Co. design engineer; Mrs. Tex LaGrone, vice president; Larry Fowler, parts manager, and others on Executive's famous team, stress skilled craftsmanship and deep-dish hospitality. They rely on Southwest Airmotive for AC spark plugs, Aeroquip hose and fittings, Eveready lamps, Bendix starters and generator parts, Techalloy safety wire and other supplies available through SAC's nearby Midwest Division warehouse.

MOUNTAIN STATES AVIATION, Stapleton Airfield, Denver, Colo.

L. to R.: Pete Petersen, Service Manager; Lester N. Longbrook, Executive VP, and Bob Carney, Parts Manager

SALUTE! Personalized service, in keeping with Western tradition, characterizes each customer-contact by the friendly, capable folks at Mountain States Aviation. This policy of sincere interest in flyers' problems and convenience has kept the company consistently among the Nation's top 10 distributors of the Piper Aircraft Corp. which it has represented for 17 years. Quality is the keystone, too, in Mountain States' Piper-authorized shops. Southwest Airmotive's Rocky Mountain Division in Denver supplies this notable neighbor with miscellaneous hardware and with the products of AC, B. F. Goodrich, Aeroquip, Exide, 3M, and Delco-Remy.

PRECISION AEROMOTIVE CORP., International Airport, Houston, Tex.

At Left: Salesman Sam Matzas, Kardex Clerks Janice Lane and Mrs. Naydean Mahanay. At Right: Engine Supt. George Hudson and President Phelps Lane.

SALUTE! Twenty-seven years of steady growth and success in the highly-competitive world of aviation can be due to but one thing: Quality – the word best summing up the Precision Aeromotive story in Houston. President Phelps Lane and his management team average more than 22 years of aviation experience per man! In its busy, modern engine, propeller, and accessory shops, and stockrooms, Precision regularly requires 24,000 items in 53 categories. Southwest Airmotive's Houston Division is Precision's source for vital items from AC, Aeroquip, Bendix Red Bank, Bendix Utica, Bendix Products (Stromberg), Bendix Scintilla, and others.

THE DISTRIBUTION DIVISION

Southwest Airmotive Company

Serving America's Heartland with Flying's Finest Supplies

KANSAS CITY • ST. LOUIS • DALLAS • DENVER • HOUSTON

Just among ourselves

What's Wrong With This Trend?

A MARKET analysis on pages 26-27 in this issue reports that business-flying use of new light twins has become a phenomenon — three new twins are now being sold for every Cub.

Analysis of sales by lightplane manufacturers for 1960 shows 1,255 twins sold as compared with 329 Cubs. More than 3,000 new twins have been sold during the last three years.

The increasing ratio of twins to 2-place single-engine planes is one reason why the lightplane industry's annual billings have skyrocketed from $19.2 million ten years ago to $151.2 million last year, although unit sales have only doubled from 3,386 in 1950 to 7,588 last year. The average billing per airplane has jumped from only $5,600 in 1950 to $19,928 in 1960.

In other words, the airplanes with the most utility are the ones that account for the business-use boom. The twins were the only category to show an increase in 1960, 259 more being sold than in 1959. Losses of 208 and 25 units were recorded for the 1-3 place and 4-place categories, respectively.

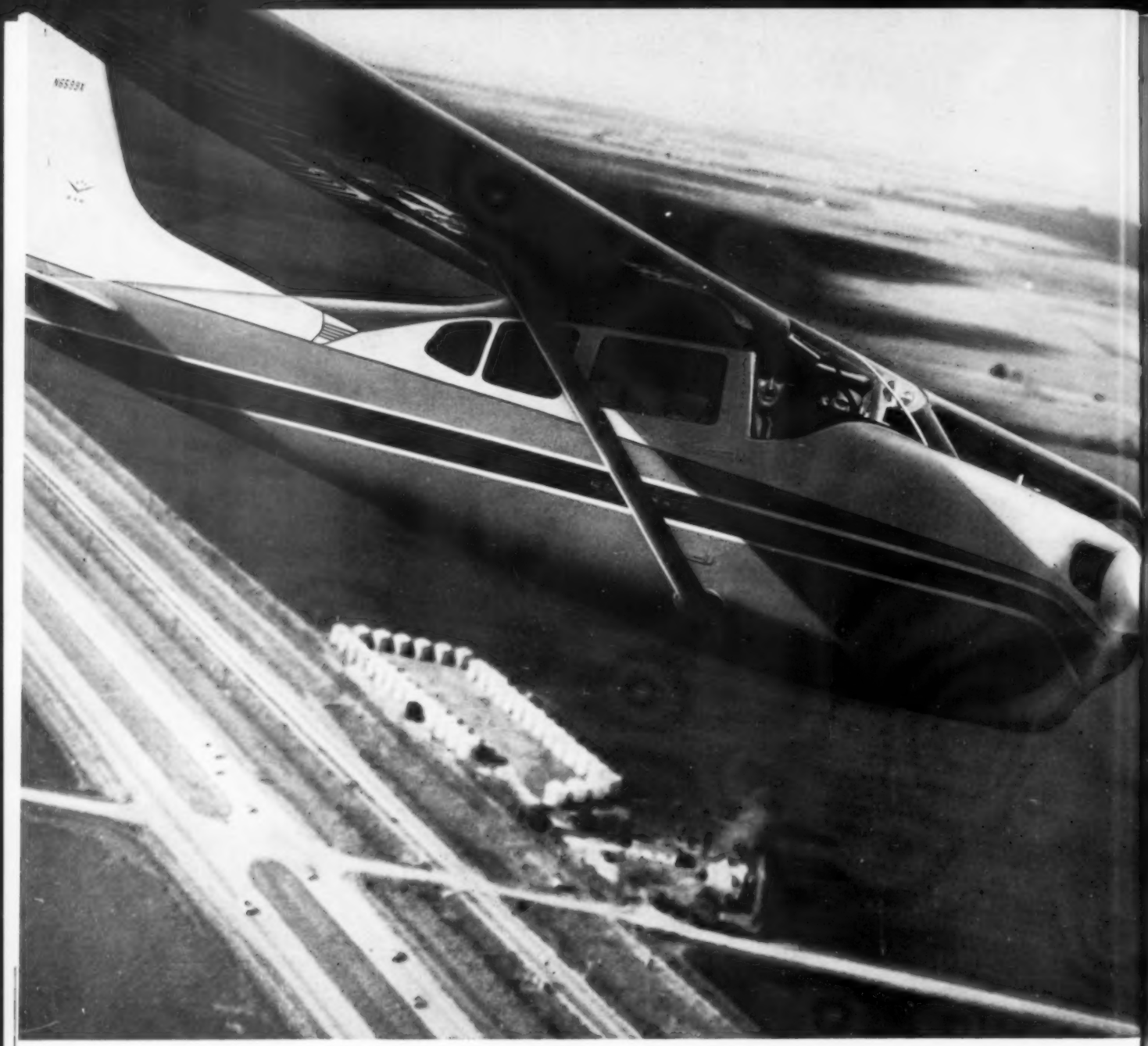
For the sake of healthy, balanced growth of the industry it is necessary to probe deeply into the reasons behind these market trends. Two major questions are posed. First, will the average billing per airplane continue to rise as it has during the past ten years? Second, what can be done to re-vitalize the market for single-engine 4-place and smaller airplanes, which form the real base of the market for the larger, faster and more-fully-equipped airplanes?

In substance, we're asking, "What's wrong with this picture?"

Of one thing we are certain — you can't build a healthy market in an atmosphere of fear and confusion, and the past couple of years represent a classic example of misguided thinking and the spread of fear psychology. People with selfish axes to grind pros-

Cessna's New Tandem-Engine Twin Makes First Flight

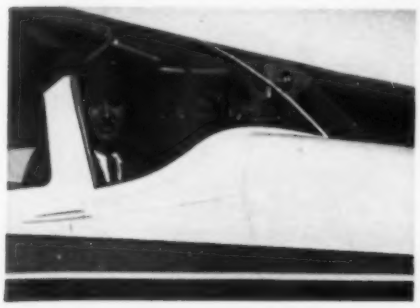
A RADICALLY-DESIGNED light twin for business flying, its tandem engines on each end of the cabin rather than on the wings, made its first flight on Feb. 28 at Wichita. Cessna Aircraft Company's vice president, Del Roskam, said the 4-place design eliminates the need for multi-engine pilot ratings because both engines are on the center thrust line and failure of one creates no yaw or control problem. Named the Cessna Skymaster, the new twin will not be shown publicly until later this year, with deliveries during 1962. No details were released. Roskam said it will outperform anything in the low-price twin field and "its price is expected to be most competitive." History-making sales volume is expected because it combines single-engine handling simplicity with twin-engine safety for flying at night and atop the overcast.



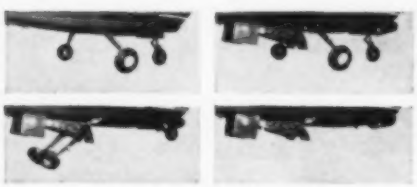
For many reasons, the advanced Cessna 210 became the world's best-selling high-speed business plane in '60. Now for 1961—five new reasons why you'll prefer the Cessna 210.

See column next page—then your Cessna dealer. At the airport, look for the Cessna pennants, sign of extra Cessna service at over 375 dealers around the world. Here: Cincinnati Air Activities, Inc., Cincinnati, Ohio.

MEN WHO KNOW AIRPLANES FLY CESSNA



BESIDES SPEEDS
UP TO 199 M.P.H....



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THE CESSNA 210 GIVES YOU:

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3. **More luxurious interior** with beautiful appointments and adjustable "Polycloud" seats.

4. **Improved cabin comfort** with new "Blend-Temp" heat and fresh air circulating system.

5. **Extra smart styling** with a bold new design in over-all, 2-color paint. You can choose from 8 color combinations.

TAKE A DEMONSTRATION FLIGHT and try the 210's many other features. Call your Cessna dealer now (Yellow Pages). Look at all 12 models . . . starting at $7,495. (210: $23,450.) Also ask about his auto-type finance and lease plans. Or for further information, write: Cessna Aircraft Co., Department FM-6, Wichita, Kansas.

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CESSNA

12 BUSINESS AIRCRAFT

pered by spreading propaganda that the Federal Aviation Agency was hell-bent on regulating private flying out of the air. Far too many customers at the grassroots level were brain-washed to the point of believing that restrictions and regulations were so bad that they might as well give up flying. Constant emphasis on what's wrong with aviation rather than what's right with it has taken its toll.

So first and foremost, the climate simply isn't healthy for attracting new customers and keeping many present customers on flying status at the grassroots. Conversely, the people who go their own way in their flying for business or pleasure, ignoring the windmill fighters, continue to operate about like they always have, unmindful of any barriers being thrown into their paths other than some traffic problems in high density areas.

The tragic aspect of this situation is that the people who stand to prosper most from healthy growth of utility aviation have not lifted a finger to counteract those influences which would have you believe we're going to hell in a handbasket.

They have not joined forces to promote the construction of thousands of landing strips, the encouragement of flight courses in our schools and colleges, the nurturing of various kinds of sports flying and adequate support of flight safety programs. For the want of a nail, the shoe was lost and for the want of the shoe, the horse was lost and it won't be long until the battle is lost unless we re-form our ranks and find the nail.

Fortunately, the signs are all too clear and there's time to pull ourselves out of our own little narrow, selfish efforts to skim off the cream and let the devil take the hindmost. The downward trend in the sale of smaller airplanes can be arrested while simultaneously marketing with continued success the amazingly efficient high-performance airplanes which have become so vital to American business enterprise.

Perhaps the new FAA leadership will see the light and assist in an industry-wide attempt to clear the air and provide a healthy, constructive, truly national program of basic aviation development, getting off the "computer jag" and devoting more time and talent to ways and means of at least creating a wholesome, attractive atmosphere. There is good evidence that FAA is moving in this direction.

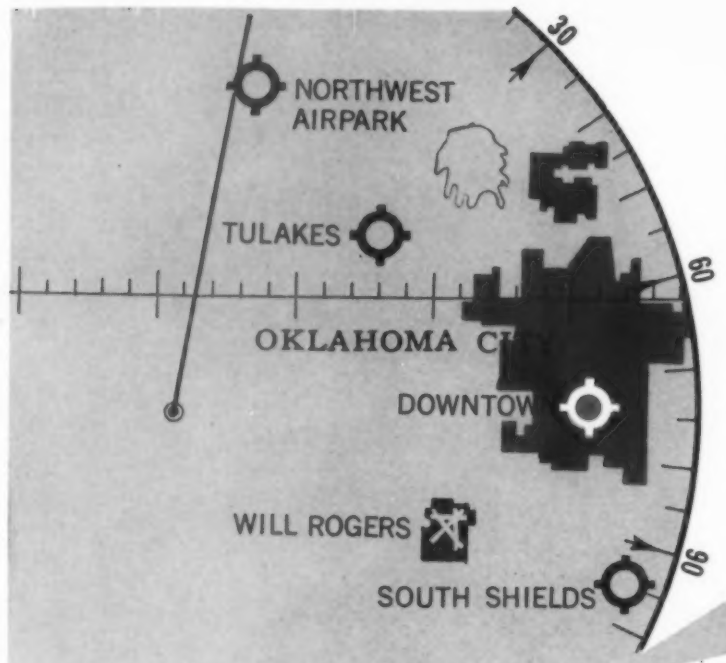
But the real push and inspiration and impetus must come from the industry itself. We have the vehicles, the machinery, the organization to do the job. All we need is leadership.

Dawn take-off by Bell 47G for record flight.

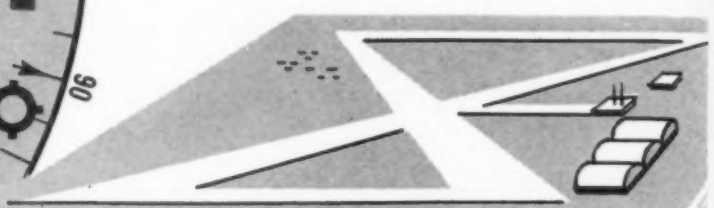
11 New World Records for Bell Helicopters

Two Bell Helicopter Company pilots, Al Averill and Lou Hartwig, claimed 8 new world records in a 10-day period ended Feb. 8 under NAA sanction. They used a 3-pl. Bell 47G and a 4-place Bell 47J-2. The new records: (1) 100-kilometer speed, Weight Class E. 1. c (2,204.6 to 3,858 lbs.), 107.032 mph. in Bell 47J-2; (2) 100-kilometer speed, Weight Class E. 1. b (1,102.3 to 2,204.6 lbs.), 104.613 mph. in Bell 47J-2; (3) distance in closed circuit, Class E.1.b, 631.436 miles in Bell 47G; (4) 500-kilometer speed, Class E.1.b, 73,985 mph. in Bell 47G; (5) 1,000-kilometer speed, Class E.1.b, 73.641 mph. in Bell 47G; (6) straight-line distance without payload, Class E.1.b, 729 miles in Bell 47G; (7 and 8) speed between two predetermined points, 102.392 mph. in Bell 47G for both Class E 1 (all copters) and Class E.1.b.

Following the record flights, three world helicopter records for women were claimed by Dr. Dora Dougherty, a Bell Helicopter scientist with only 15 hrs. of solo time as a copter pilot. Her hops bring to 11 the number of new records for Bell. Flying a Bell 47G-3, she claimed 19,406 ft. as a new altitude record, 404.36 miles for a new straight-line distance record, and 91.26-mph. point-to-point speed on the long trip as a new record. Six of Bell's new helicopter records exceed marks held by Russia and Czechoslovakia. E. J. Ducayet, Bell president, said Bell now claims 19 world helicopter records — more than the total held by any foreign nation or by all U. S. manufacturers combined.



IT'S ALMOST LIKE LANDING ON YOUR HOTEL



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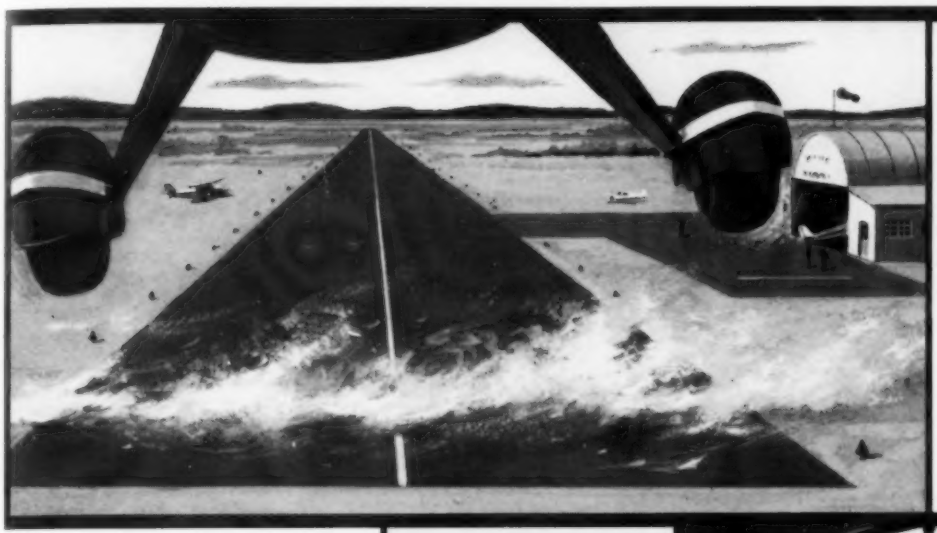

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While making your approach, keep a keen eye out for low level, wind-blown dust near the runway. If it's moving in a different direction than the wind sock, you should expect turbulence or cross winds as you're touching down.

TUCK IN BEFORE TAKE-OFF!

Sounds fantastic, but many a carefree pilot has taken off with a seat belt dangling out the door of his plane. In flight, a dangling seat belt can create terrific noise – even damage – as it raps against your fuselage. So keep seat belts inside . . . and fasten 'em!

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AERO COMMANDER, INC., BETHANY, OKLAHOMA, subsidiary of ROCKWELL-STANDARD CORPORATION

"THIS B.F.GOODRICH DE-ICER SYSTEM HAS BEEN ONE OF THE PRIME CONTRIBUTIONS TO THE SAFETY OF OUR OPERATION. IF ICE ACCUMULATES ON WING AND TAIL SURFACES, THE DE-ICERS GET RID OF IT SIMPLY AND EFFECTIVELY. THROUGH THIS INCREASED SAFETY WE HAVE APPRECIABLY INCREASED THE UTILITY OF OUR AIRCRAFT DURING THE WINTER SEASON."

Donald Esser, Chief Pilot of Snyder Corporation, Detroit. The company's Cessna 310C is equipped with BFG pneumatic De-Icers on wing and tail leading edges. The ship carries company personnel over the eastern half of the U. S., flies 150,000 miles a year.

BFG LIGHTWEIGHT PNEUMATIC DE-ICERS. Weigh approximately 50 pounds. Operation is pneumatic, with a compressed air reservoir providing enough energy for up to 7 hours of de-icing between charges.

ELECTRICAL PROPELLER DE-ICER. Complete kit weight approximately 10 pounds; low power requirements. Current is cycled automatically for effective de-icing.

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*Taken from one of the many case histories in our file . . company's name on request.

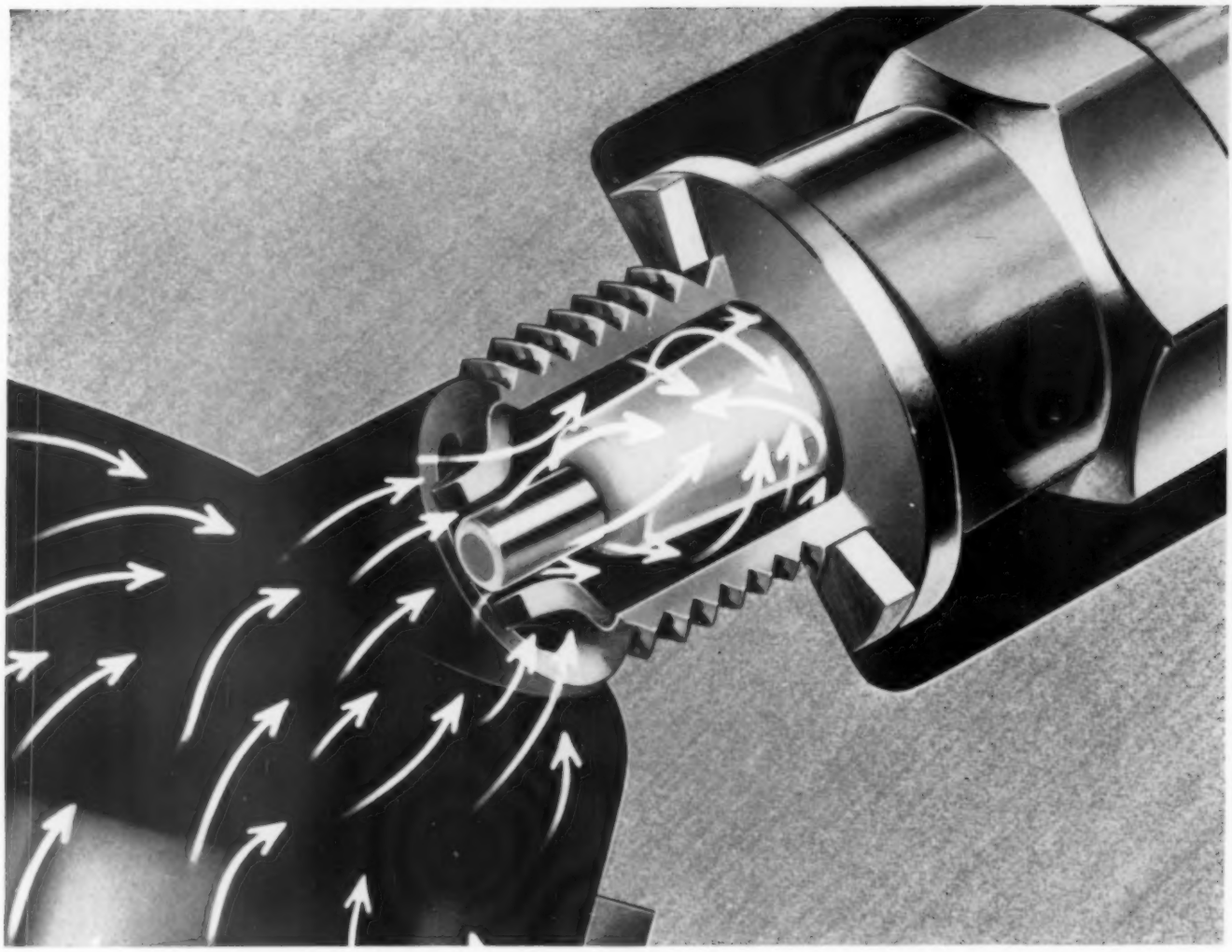
What is an executive's time worth in making sales, closing contracts, supervising projects . . thirty, forty, fifty dollars an hour? Use a little arithmetic, and you can figure how substantial U. S. companies make their Bell pay.

Operating and maintenance costs of a Bell helicopter are low . . lower than any other make, class for class. And a Bell will fly approximately two years (often over 100,000 miles) without a major overhaul. Add these factors to time saved and the answer is, of course, profits.

Will unshackling *your* executives from slow ground travel mean *more profits* for your company? Let's discuss Bell helicopters and see. Just drop us a line. We will be glad to make a *Bell Analysis* of your business to determine if a Bell will pay its way, or if it is smarter for you to charter a Bell. No obligation of course . . just write: Commercial Sales Manager, Dept. 411C, P. O. Box 482, Fort Worth, Texas.

BELL HELICOPTER COMPANY

FORT WORTH, TEXAS • A DIVISION OF BELL AEROSPACE CORPORATION • A TEXTRON COMPANY



Notice how larger bore opening allows full blast of combustion gases to cleanse the longer core nose for greater protection against fouling-deposit build-up.

Get full-firing performance—longer . . . with new foul-resistant Champion Spark Plugs

New firing end design prevents fouling build-up even under long periods of idle . . . virtually eliminates burn-out . . . and doubles, even triples, spark plug life!

When you operate your aircraft under conditions that require frequent long waits at idle, full power at take-off, and smooth cruise power for extended periods, you can rely on Champion's new foul-resistant spark plugs for full-firing performance—longer.

The remarkable fouling resistance of these new spark plugs stems from a completely redesigned firing end. A new two-prong electrode (instead of four-prong), bigger bore and longer core nose "open up" the business end of the new plugs to the full blast of combustion gases for continuous self-cleaning action.

A world record flight dramatically demonstrated the performance of these new plugs. Max Conrad, shattering records with a 3-day, 7,668-mile, single-engine flight, reported: "Champion's new foul-resistant plugs made such a flight possible!"

So to get full-firing performance from *your* aircraft, get these new foul-resistant Champions today. Approved for all popular aircraft, they are available in REM40E and REM38E for short reach ⅝ 24 applications, as well as All-Weather RHM40E and RHM38E. RHB37E, RHB32E and RHB29E are available for long reach ¾ 20 installations.

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the completely new and unique
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HELICOPTER AIRLINES ENTER THE JET AGE

Taking its first step into the turbine era, Los Angeles Airways has inaugurated Sikorsky S-62 service—the first scheduled turbocopter operation in the world. The S-62, third generation of Sikorsky helicopters to serve L. A. A., carries nine passengers, cruises at 100 miles per hour, offers a range of 285 miles. Its flying boat hull enables the S-62 to land on water or any surface for emergency operation. □ Besides the speed and passenger comfort offered by its turbine powerplant, the S-62 provides outstanding economies for L.A.A. It carries a 90% greater load than the Airways' piston-powered S-55's for the same fuel cost at 28% higher speed. Through the use of proven components, it offers overhaul periods 2-3 times greater than have ever before been offered on a new commercial helicopter. □ Next step in L.A.A.'s turbinization program: five 28-passenger, twin-turbine Sikorsky S-61's . . . providing all-weather operation and further reductions in seat mile costs.

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THE PIPER Pawnee
Puts Profits in Your Pocket

More aerial applicators are buying the Piper Pawnee than any other agricultural plane in the world. Simple reason. The Pawnee is the right size for most dusting and spraying jobs. It does the job well. It's not too expensive. It's economical to operate and ready to go when you need it. Spare parts are readily and quickly available.

Talk to Pawnee operators everywhere and you'll find them very pleased and more than satisfied with the Pawnee's performance, stamina and ability to do the job. And you'll find they're making good solid profits. You, too, will find brand new equipment, designed specifically to do the job, thoroughly proved and improved, will mean more profits for you. Investigate the Pawnee. You'll pick it, too. See your Piper dealer or write for Pawnee literature, Dept. F-3.

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THE AG PLANE WITH THE "Safety Capsule" COCKPIT

Rugged Turn-Over Structure—Welded steel structure over and around cockpit protects pilot in case of nose-over. Large fiber glass plate over cockpit will keep structure from sinking into soft mud.

Head Cushion—Rounded aluminum cushion above instruments provides best impact absorption with minimum injury, should pilot's head pitch forward.

Cushioned Head Rest—Cushions back of head and cervical spine against "whip-lash" rear loads.

Shoulder Straps—Keep pilot securely attached to seat, prevent head or body from pitching forward. Inertia reel permits freedom of action. Wide, extra strong seat belt included, too, attached directly to structural stress points in fuselage.

Pilot Comfort—To reduce pilot fatigue (cause of many accidents) a deeply upholstered, Apache-type seat is provided, adjustable fore and aft.

Protrusions Eliminated—All instruments and controls have been placed beyond possible reach of pilot's head.

Safety Pedals—All protrusions from rudder pedals have been removed to prevent injury to ankles.

Large Exit Space—Provides ample room to crawl out quickly from either side.

Plus ...perfect visibility...
rearward cockpit location...
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HAROLD KREAGER, Kreager Spraying Service, Kennebec, South Dakota:
"I sure like the Pawnee. The first month we used it, we sprayed 20,000 acres with it, and we had only two days that we could work all day. (In those two days we sprayed 1,750 acres one day and over 2,000 acres the other.) That is 7,000 acres more than we sprayed last year with 2 planes and 2 pilots.
"We have had many, many compliments on the plane and the job it does."

3 Twins Fo

Piper sold most of the twins in 1960, delivering 431 of which 329 were Aztecs and 102 were Apaches, as compared to 311 twins in 1959.

Beech twin sales totaled 379 last year vs 297 in 1959. In the 1960 total were 122 Travel Air's (above), 87 Twin-Bonanzas, 81 Model 18's, 66 Queen Airs and 23 Barons.

Cessna Aircraft delivered 290 twin-engine Model 310's during 1960. During 1959, Cessna delivered 240 Model 310's.

Sales of twin-engine Aero Commanders numbered 155 in 1960 vs 148 in 1959. In the 1960 total were 69 Model 500's, 70 Model 680's, 13 Model 560's and 3 Model 720 pressurized Alti-Cruisers.

FOR the second year in a row, lightplane deliveries in 1960 reached a record high with the Utility Airplane Council of the Aerospace Industries Association reporting 7,588 airplanes worth $151,220,000 in billings as compared to 7,689 airplanes delivered during 1959 worth $129,876,000 in billings. Valued at retail prices, the 1960 shipments were worth over $200,000,000 for a gain of about $30,000,000 over 1959.

Because no sales were reported for three models in 1960 as they were for 1959, their removal from the 1959 totals would reduce that figure to 7,562 and thus the 1960 total would show a gain of 26 airplanes over last year. This reduction from the 1959 totals would be for 91 Beech Mentors, 24 Cessna L-19's and 12 Helio Couriers, no shipments of which were reported for 1960.

A compilation of the AIA shipments accompanies this article and lists 8 manufacturers as reporting for 1960 as compared to 9 reporting for 1959, no 1960 report being included for Helio.

The record shows Cessna delivered 49% of the 1960 airplanes for 38% of the billings, followed by Beech (13% and 28%), Piper (31% and 23%), Aero Commander (2% and 8%), Mooney (2% and 2%), Champion (3% and 1%), Call Air and Lake.

Of 35 different models delivered by the 8 manufacturers, 12 were twin-engine business planes, 12 were 4-place single-engine business planes and 11 were 1-3-place single-engine utility planes.

A FLIGHT MAGAZINE analysis of the shipments reveals that business twins were strongest in demand, the 1-3-place utility models declined in popularity and 4-place business planes just about held their own. By types, the 1960 deliveries included 1,255 twins (up 259 in number over 1959), 5,026 four-place models (off 25 units) and 1,307 one-to-three-place models (down 208 airplanes).

This emphasizes the growing popularity of twin-engine business planes, which have become aviation's most dramatic phenomenon. Four manufacturers have delivered 3,120 twins during the last three years, selling 869 in 1958, 996 in 1959 and 1,255 in 1960.

ivery Cub Sold During 1960

To see the impact of this record, consider this: One twin was sold for each 2-place airplane delivered last year. Or we can size up the demand for twins still another way, as follows: It was not too long ago that the Cub was the yardstick of general aviation's popularity — but in 1960, sales of twins outnumbered Super Cub deliveries more than 3 to 1, being 1,255 to 329.

The increasing ratio of twins is one reason why the lightplane industry's annual billings have skyrocketed from $19.2 million in 1950 to $151.2 million in 1960, although the annual units delivered have only doubled from 3,386 in 1950 to 7,588 in 1960. The average billing per plane has increased from $5,600 in 1950 to $19,928 for 1960. Another reason for the increase in dollar volume is that today's airplanes are delivered with more factory-installed electronic, radio and navigation equipment. Increases in horsepower and production costs have also contributed to the rising value curve.

As to how the 8 manufacturers and their models shared the 1960 market in comparison with that of 1959, the following will chart the current trends:

Twins — Piper led with 431, up 120 over 1959, followed by Beech with 379 vs 297, Cessna with 290 vs 240 and Aero Commander with 155 vs 148. Total twins, 1,255 vs 996, up 259.

Four-Place Single-Engine — Cessna led with 3,076 vs 2,676, followed by Piper with 1,090 vs 1,671, Beech with 583 vs 505, Mooney with 172 vs 182 and Lake with 5 vs 17. Total 4-place, 5,026 vs 5,051, down 25.

One-to-Three-Place Single-Engine— Piper led with 692 vs 548, followed by Cessna with 354 vs 648, Champion with 248 vs 274 and Call Air with 13 vs 45. Total 1-to-3-place, 1,307 vs 1,515, down 208.

Average Billings per Airplane by Manufacturers — Aero Commander led with $76,883 vs $71,600 in 1959; followed by Beech with $44,761 vs $38,800, Mooney with $16,168 vs $11,489, Cessna with $15,205 vs $12,700 and Piper with $15,177 vs $13,000. Average billing per plane by manufacturers, $19,928 vs $16,800.

Most Popular Twins — Piper Aztec, 329 in 1960 (not on market in 1959); Cessna 310, 290 vs 240; Aero Commander, 155 vs 148; Beech Travel Air, 122 vs 142; Piper Apache, 102 vs 311; Beech Twin-Bonanza, 87 vs 66; Beech 18, 81 vs 89, and Beech Queen Air (66) and Baron (23), new on market in 1960.

Most Popular 4-Place — Cessna 172, 1,017 vs 874; Cessna 182, 667 vs 774; Cessna 210, 610 vs 43; Cessna 175, 501 vs 727; Piper Comanche 250, 469 (including 275 units of 180-hp. version, Comanche total was 774 vs 995); Piper Tri-Pacer, 446 vs 676; Beech Bonanza, 345 vs 480; Cessna 180, 283 vs 258; Beech Debonair, 238 vs 25; and Mooney Mark 20, 172 vs 182.

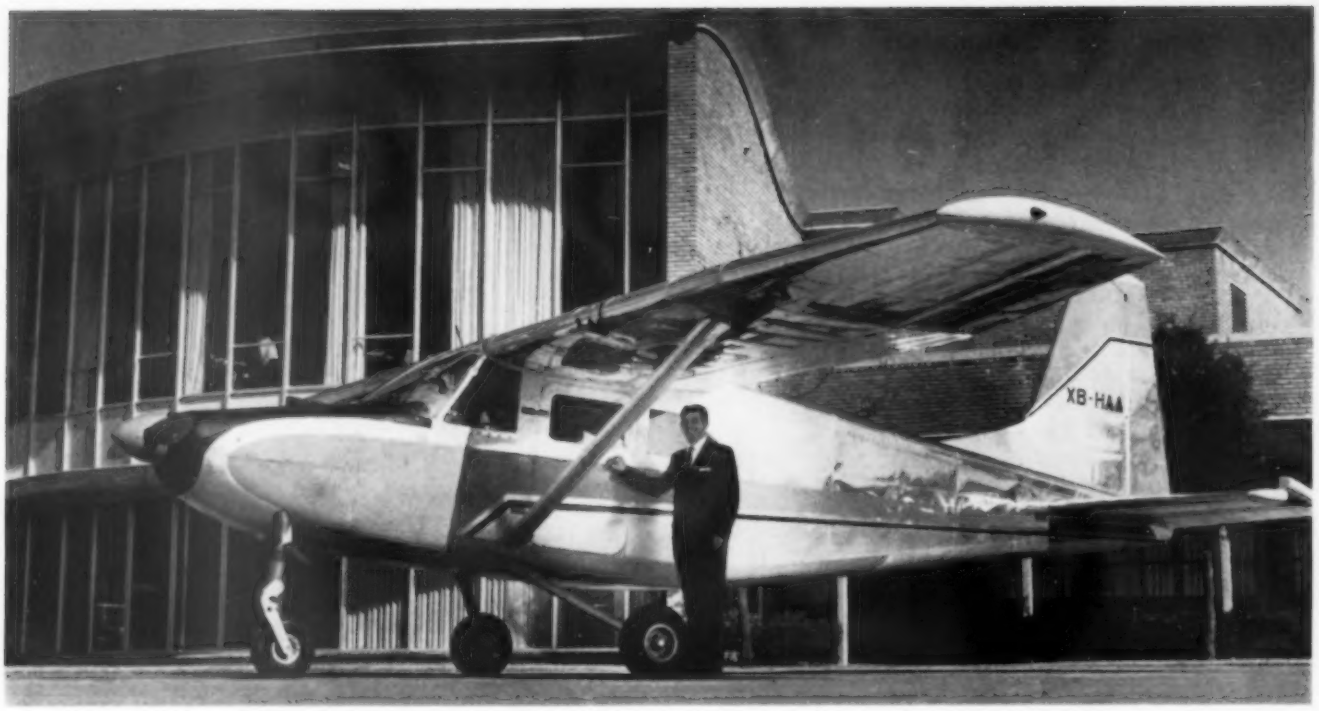
—T.A.

1960 vs 1959 Lightplane Deliveries

As Reported by Utility Airplane Council, Aerospace Industries Association

	Jan.-Dec., 1960			Jan.-Dec., 1959	
	No. Planes	Billings (Thousands)		No. Planes	Billings (Thousands)
AERO DESIGN					
Model 500A, B	69		Model 500	58	
Model 560E	13		Model 560E	22	
Model 680E, F	70		Model 680E	52	
Model 720	3		Model 720	6	
Totals	155	$11,917	Totals	148	$10,626
BEECH					
Model 18	81		Model 18	89	
Debonair	238		Debonair	25	
Bonanza	345		Bonanza	480	
Twin-Bonanza	87		Twin-Bonanza	66	
Travel Air	122		Travel Air	142	
Baron	23		....	....	
Queen Air	66		....	....	
Totals	962	$43,061	Totals	893	$35,701
CALL AIR					
A-5 and A-6	13	$88	A-5 and A-6	45	$354
CESSNA					
Model 150	354		Model 150	648	
Model 172	1,015		Model 172	874	
Model 175	501		Model 175	727	
Model 180	283		Model 180	258	
Model 182	667		Model 182	774	
Model 210	610		Model 210	43	
Model 310	290		Model 310	240	
Totals	3,720	$56,664	Totals	3,588	$45,703
CHAMPION					
Traveler	33		Traveler	39	
Tri-Traveler	72		Tri-Traveler	91	
Sky Trac	14		Sky Trac	112	
Challenger	83		Challenger	2	
DX'er	19		DX'er	30	
Tri-Con	27		....	....	
Totals	248	$1,492	Totals	274	$1,521
LAKE					
LA-4	5	$115	Skimmer	17	$367
MOONEY					
Mark 20	172	$2,781	Mark 20	182	$2,091
PIPER					
Super Cub	329		Super Cub	470	
Tri-Pacer	446		Tri-Pacer	676	
Apache	102		Apache	311	
Aztec	329		....	....	
Comanche 180	275		Comanche	995	
Comanche 250	469		....	....	
Pawnee	363		Pawnee	78	
Totals	2,313	$35,105	Totals	2,530	$33,134
TOTALS	7,588	$151,220	**TOTALS**	7,689	$129,876

NOTES: Beech 1959 totals included 91 Mentors. Cessna 1959 totals included 24 L-19's. Totals for 1959 included 12 Helio Couriers for $379,000.



Larger than the Cessna 180 and smaller than the de Havilland Beaver, the tricycle-geared Lockheed-Azcarate LASA 60's wing trailing edge is 6 ft. 7 ins. off the ground. Note small scoop atop engine cowl in front of windshield, for air intake supplying turbo-supercharger, which has large vertical exhaust stack next to nosewheel strut. In background is Southwest Airmotive terminal.

—(FLIGHT MAGAZINE Photo.)

Workplane First With Turbo-Supercharging

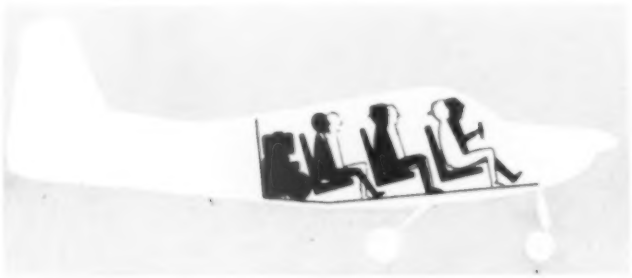
By TOM ASHLEY

AVIATION progress owes a lot of thanks to the unglamorous work airplane as it huffs and puffs to perform industrial jobs with unmatched efficiency, to increase food, fibre and mineral production and to open the wilderness for development. Not unlike its predecessors and just as unglamorous, the newest workhorse of the air is making aviation progress right now, even before two new factories built to produce it begin deliveries. It is the new Lockheed-Azcarate LASA 60, which has the distinction of being the first general aviation fixed-wing aircraft on the market with turbo-supercharging for improved performance at altitudes above sea level.

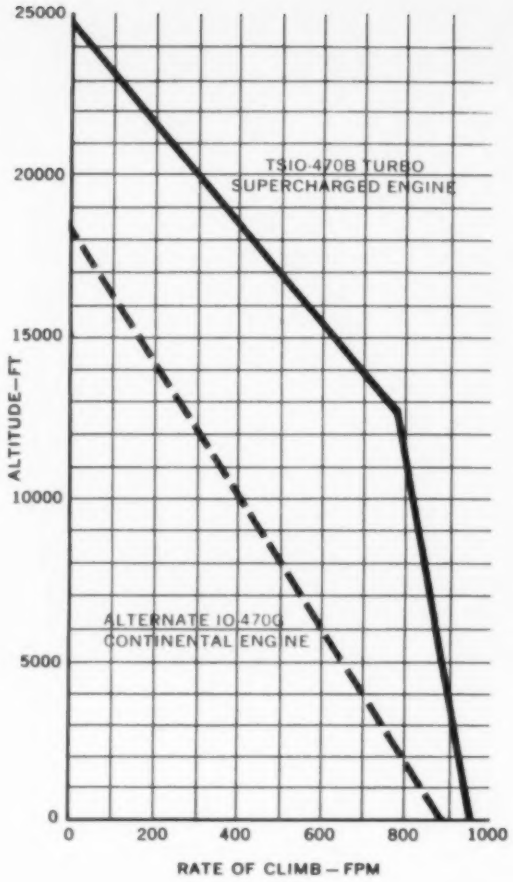
What makes the LASA 60's contribution to progress especially significant is the fact that it offers the bush pilot a simple, un-gimmicked, un-goldplated turbo-supercharger. Miracle among aviation marvels, the Lockheed's exhaust-driven air compressor comes to the airplane operator straight off the shelf from the automotive world, where its reliability has been proved by thousands of hours of operation on earth-moving tractors and on trucks, and where its success earned quantity production.

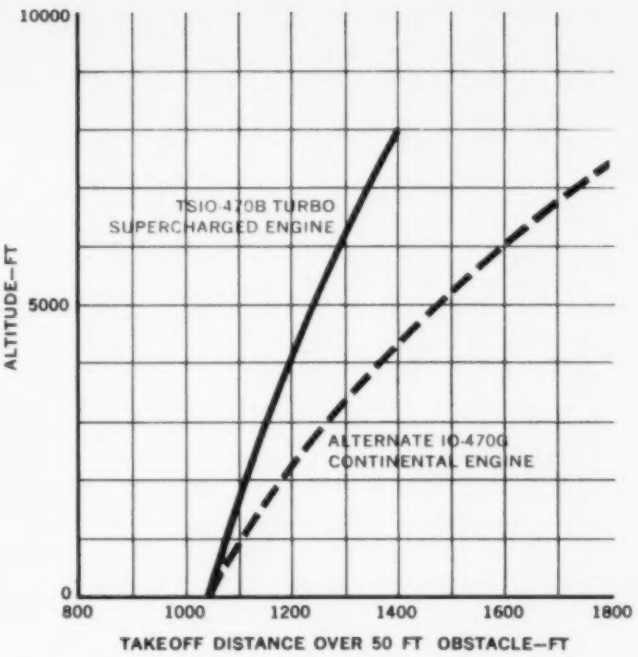
Hung on a 6-cylinder, fuel-injected 260-hp. Continental engine, this turbo-supercharger provides the LASA 60 with sea level power all the way up to about 12,500 ft. Instead of sweating out or completely losing his work with a sea level engine running out of throttle, the bush pilot with the Lockheed's TSIO-470B engine finds himself in a brand new realm of flying which the engineer will describe as a relatively constant "envelope of performance." This means the work airplane can operate safely with profitable payloads to and from short fields whether they are at sea level in standard air (which few of them are) or at 5,000 ft., 7,500 ft., or even higher. Look at the Lockheed performance curves, published with this article, and you'll see how the performance varies very little from sea level to altitude with the turbo-supercharged engine as compared with the same airplane equipped with an unsupercharged version of the same engine.

Take-off distance to clear a 50-ft. obstacle, for example, is only 1,045 ft. at sea level and 1,350 ft. at an altitude of 7,000 ft. With the sea level engine, the distance jumps from 1,045 ft. at sea level to 1,735 ft. at 7,000 ft., for a stretch of about 700 ft. in the clearance requirement. Or take rate of



Sketch shows useful length of cabin, which is 11 ft. 10 ins. long, 48 ins. wide and 50 ins. high. It can carry six passengers and baggage or over 1,000 lbs. of cargo in addition to pilot and full tanks.





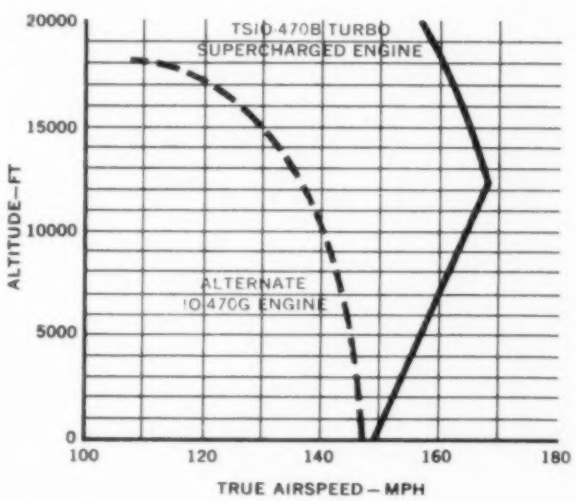
These LASA 60 performance curves are for 3,532-lb. gross weight and standard air, with payload vs range chart (below) based on take-off at 3,532-lb. gross and cruise at 10,000 ft. Solid lines are for TSIO-470B engine, dotted lines for un-supercharged IO-470G engine, both rated at 260 hp. for take-off at sea level.

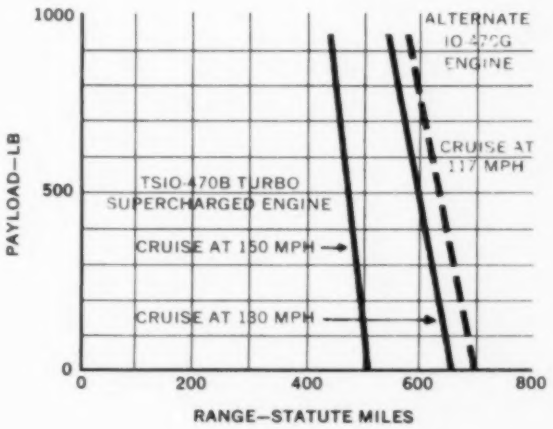
—(Charts from Lockheed Aircraft International.)

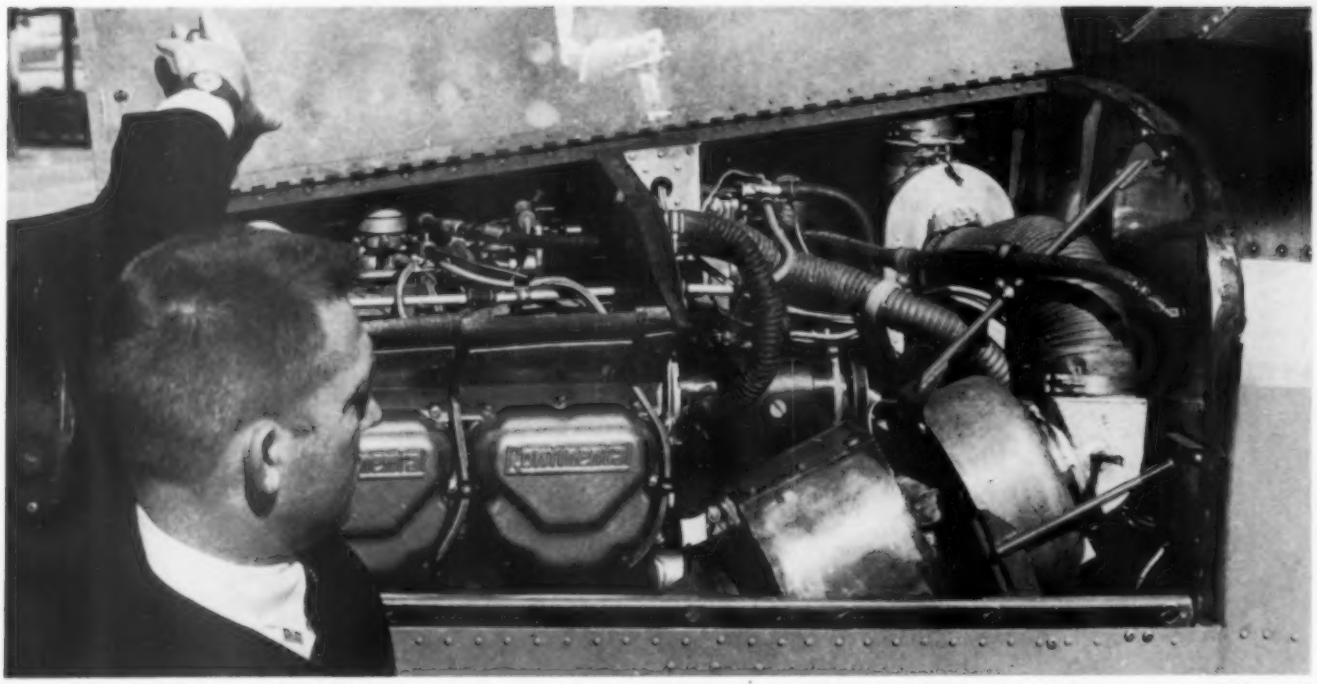
climb — while the Lockheed with unsupercharged engine climbs at about 900 fpm. at sea level, the climb rate is halved at 8,000 ft. and drops off two-thirds to only 300 fpm. at 12,000 ft. But with the TSIO engine, the Lockheed is still climbing at better than 825 fpm. as it reaches 8,000 ft., is climbing at just about 800 fpm. at 12,000 ft. and does not drop off to 300 fpm. until it passes the 20,000-ft. level (its ceiling is 25,000 ft. vs only 18,100 ft. with the plain engine). In speed, the airplane with the unaspirated engine begins to lose immediately it leaves sea level, its maximum speed deteriorating from about 146 mph. at sea level to about 136 mph. at 12,000 ft. But with the TSIO engine, the maximum speed increases immediately the airplane leaves sea level — from about 149 mph. there to about 167 mph. at about 12,500 ft.

Across the board, the turbo-supercharger's significance can thus be charted for the LASA 60 — it provides 23% less take-off distance to clear a 50-ft. obstacle at 7,000-ft. altitude, 54% higher rate of climb at 7,000-ft. altitude and 18% more speed at 10,000 ft.

To accomplish all this, the turbo-supercharger feeds the engine a full supply or quantity of intake air as the airplane climbs away from sea level and the air density decreases with altitude. Unlike the geared supercharger, it is not mechanically linked with the engine's crankshaft and therefore it does not drain any power from the engine's output to the propeller. In fact, on the Lockheed, it is not even mounted on the engine but is installed on the airframe's firewall and connected to the engine intake only by flexible tubing. Exhaust from the engine drives a small turbine in the unit. On the same shaft with this







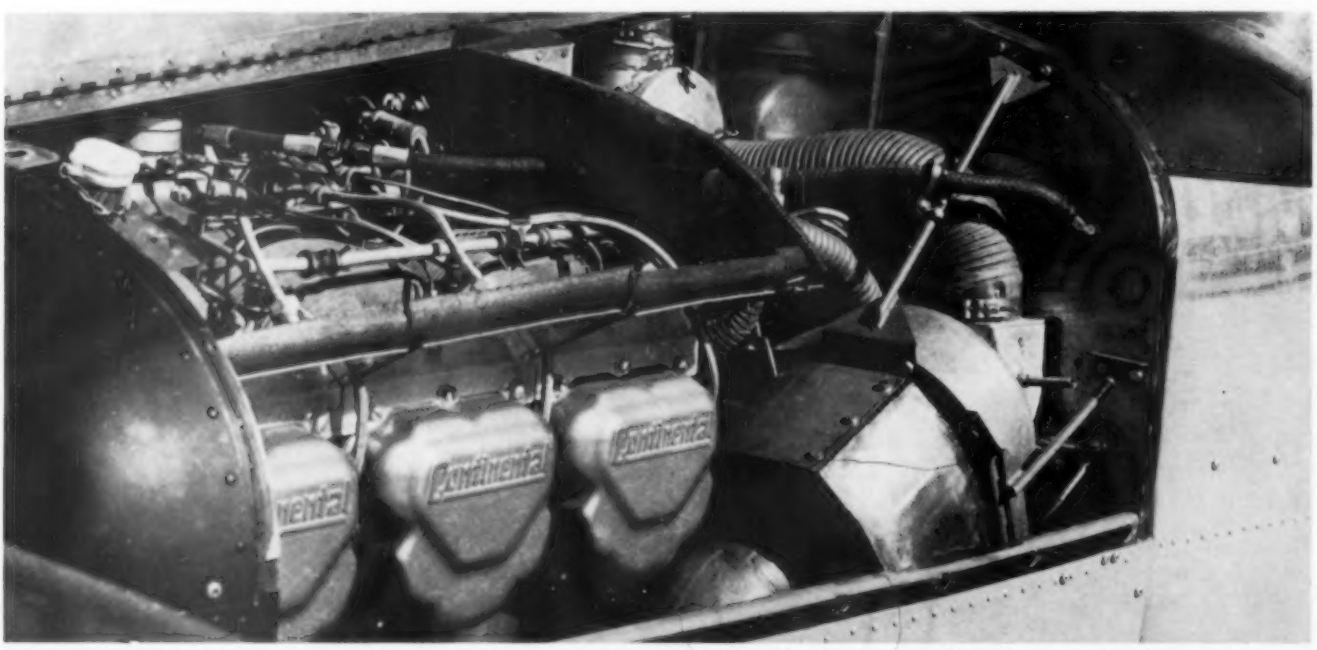
Lockheed Test Pilot Glenn Gray lifted the cowling for us to shoot this photo showing the LASA 60 installation of an AiResearch turbo-supercharger. Stainless steel shroud encloses the unit's exhaust driven turbine. On same shaft with turbine is air compressor, which takes in air from large flexible duct and pumps it into engine air intake manifold.

turbine is a compressor, or air pump. As the exhaust turns the turbine and is dumped overboard, the compressor on the other end of the shaft pumps compressed air into the engine intake.

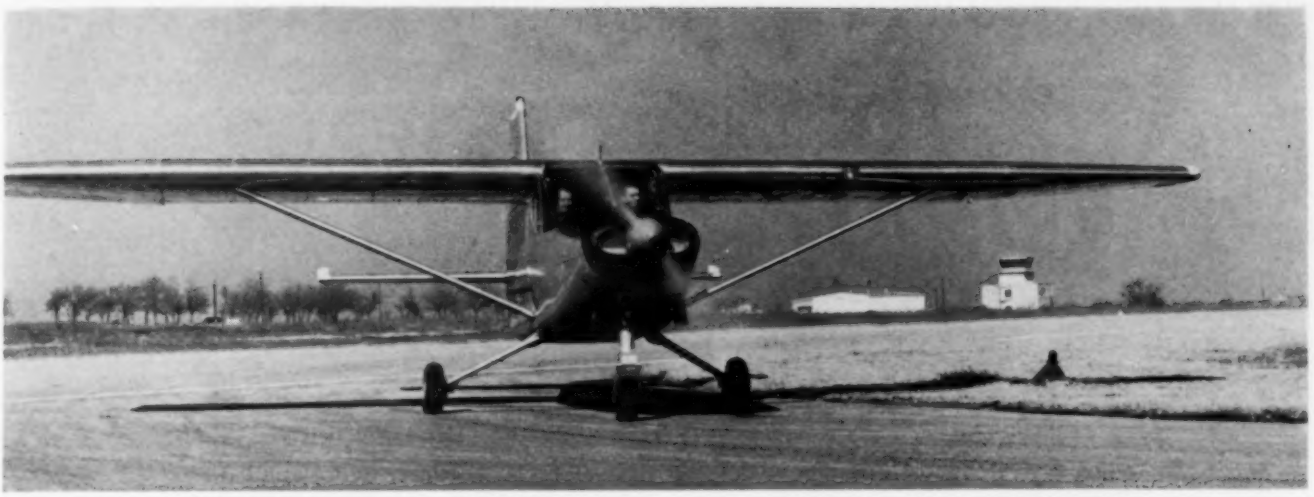
As the airplane climbs and the air becomes thinner, it offers less resistance to the exhaust and the turbine and pump therefore spin faster, compressing a greater quantity of air for the engine intake. All the pilot does is add more throttle.

This turbine-blower unit is always operating on the LASA 60. To protect the engine from over-boosting, the manifold pressure gauge is red-lined at 35.0 inches of manifold pressure, which is the never-exceed limit imposed on the pilot. The engine develops its rated 260 hp. at 2,600 rpm. and 35 ins. and this same power setting is available at 12,500 ft. This means that full throttle can not be used below 12,500 ft. without exceeding the operating limit. On take-off at sea level, for example, there is plenty of throttle travel available but not useable. So the pilot must learn to stay within the engine's limitations.

There is no supercharger indicator of any kind — not even a bearing temperature indicator. It is said that the supercharger spins at about 60,000 rpm. at 12,000 ft. with 35 ins. of engine manifold pressure. It probably is spinning at about half this speed for sea level take-off at 35 ins. However, the pilot soon learns that if he opens the throttle to indicate 35 ins.



Another view of turbo-supercharger shows how unit is mounted to firewall, rather than on engine. Fore-and-aft tube atop cylinders carries supercharged air to each cylinder at fuel injection nozzles to equalize pressure from intake manifold. Note large exit exhaust stack in front of turbine shroud. —(FLIGHT MAGAZINE Photo.)



Thick high-lift wing, forward visibility and wide gear are emphasized in this view of LASA 60.
—(FLIGHT MAGAZINE Photo.)

for take-off, there is a blower lag which will boost the manifold pressure on up to about 38 ins. He must then back off on the throttle to stay below the red-lined 35 ins. To prevent this, he simply learns to give it only 33 ins. to start his take-off and the lag soon boosts this to the 35-in. mark.

The turbine and blower wheels in the unit appear to be about 5 ins. or so in diameter and their common bearing shaft appears to be about 1 in. or less in diameter. This shaft is lubricated by engine oil, depending on pressure from the crankcase. The turbine, or "hot," section is enclosed in a stainless-steel shroud. Before exhaust from the engine enters the turbine, it passes a waste-gate valve. This valve is connected by linkage to the throttle. With partial throttle setting, only part of the exhaust enters the turbine, most of it being diverted past the wheel. With full throttle, practically all of the exhaust is valved through the turbine.

Climbing out, here's the LASA 60 at a point about 800 ft. from start of its take-off run at Addison Airport in Dallas. At gross weight, it will takeoff or land over a 50-ft. obstacle within a distance of only 1,045 ft.
—(FLIGHT MAGAZINE Photo.)

Since the unit is also used on tractors (it was developed by AiResearch), we called the local Caterpillar distributor's service manager to learn his experience with the turbo unit in the tractor field. He said it has a "wonderful" service record. "Our experience shows the operator must be careful not to open the throttle too soon after starting on a cold morning — it takes a little running to obtain normal oil pressure — and he should not shut down the engine too quickly without first idling it for three or four minutes," the service man told us. "Without normal oil pressure, the unit's bearing shaft is not stabilized and if it is spinning at high speed when the engine is stopped, there is insufficient oil and pressure to properly lubricate and stabilize it because it spins a couple of minutes after the engine stops." He said about 90% of all unit maintenance is caused by the operator using too much throttle before oil pressure becomes normal on start-up or from stopping the engine too quickly without idling.

The Caterpillar man told us the 5-inch turbocharger unit he stocks for tractors sells retail at "about $1,000."

We had a chance to try the Lockheed LASA 60 with the unit last month. Glenn Gray and Bill Grant of Lockheed were in town with the No. 2 prototype (the No. 1 prototype had the unaspirated 260 engine). Lockheed built and FAA-certificated both prototypes at its Georgia Division. A new factory has been built at San Luis Potosi in Mexico, where Lockheed-Azcarate is building up components for the start of assembly-line produc-

Lockheed-Azcarate LASA 60

Factory Data

Powered by turbo-supercharged fuel-injection Continental TSIO-470B engine rated at 260 hp. up to 12,500 ft.

No. Seats	**4-6**
Gross Weight, lbs.	**3,532**
Empty Wt., lbs.	**2,024**
Useful Load, lbs.	**1,508**
Useful Pct. of Gr. Wt., %	**42.7**
Fuel Cap., gals.	**60**
Useable Fuel Cap., gals.	**49**
Top Speed, mph.-alt., ft.	**168-12,500**

Cruising Performance—

Mph.	Miles	Alt., ft.
150	445	10,000
130	550	10,000

Stall Speed, mph.	**53**
Rate of Climb, sea level, fpm.	**940**
Rate of Climb at 12,000 ft., fpm.	**775**
Service Ceiling, ft.	**25,000**

Take-off Dist. to Clear 50-ft. Obstacle, ft.—

Sea Level	At 7,000 Ft.
1,045	1,350

Landing Dist. to Clear 50-ft. Obstacle, ft.—

Sea Level	At 7,000 Ft.
1,045	1,350

Wing Span, ft.-ins.	**39-4**
Length, ft.-ins.	**28-1**
Height, ft.-ins.	**10-8**
Wing Area, sq. ft.	**210**
Wing Loading, lbs. sq. ft.	**16.8**
Power Loading, lbs. hp.	**13.5**
Tread, ft.-ins.	**9-4**
Wheel Base, ft.-ins.	**6-9**
Propeller Diameter, ft.-ins.	**7-2**
Propeller Ground Clearance, ins.	**18**
Cabin Length, ft.-ins.	**11-10**
Cabin Width, ft.	**4**
Cabin Height, ft.-ins.	**4-2**
Useful Cabin Volume, cu. ft.	**120**
Cargo Door Width, ft.-ins.	**4-8**
Psgr. Door Width, ins.	**25.5**

NOTES: All performance is for gross weight at sea level unless noted. Alternate maximum take-off weight of 3,752 lbs. is authorized under CAR Part 8.

These two views show the Lockheed workplane's big Fowler flap fully extended (left) and partially extended (right). Note how it moves rearward as well as down. Adjustable cowl flap behind nose strut is for engine-cooling air. To left of it is vertical exhaust stack and rotating beacon. —(FLIGHT MAGAZINE Photos.)

tion with the first airplane due off the line in March. A new factory in Argentina will also produce the airplane, as will Macchi in Italy.

The Lockheed crew said the sales price has not been firmed, although the airplane with the TSIO-470B is expected to sell for less than $25,000. Sales in the U. S. and Canada will be pushed, with policies yet to be determined. The Mexican project is a joint venture in which Lockheed International is in partnership with Azcarate interests in Mexico.

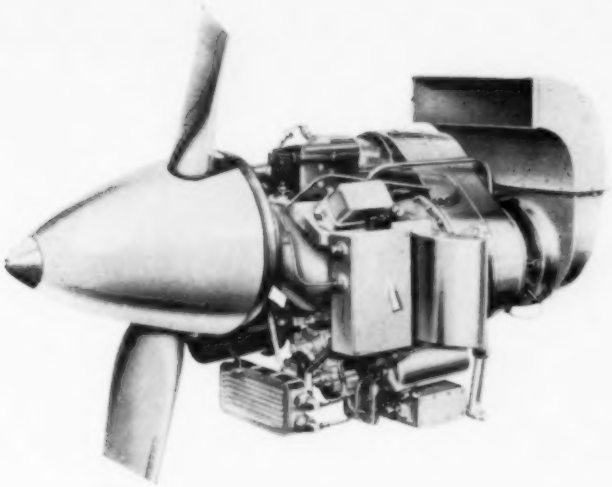
The LASA 60 (from the initials of the firm, Lockheed-Azcarate, S. A., with the "S. A." meaning "incorporated") has excellent flight characteristics, as it must to be successful as a workhorse. It is as easy to fly as the simplest airplane could possibly be. Its tricycle gear simplifies ground handling and landing, especially in crosswind conditions. Its nose-wheel strut is beefy to take punishment on rough fields and its main gear struts are of flexible tubular steel to absorb shock. These main struts are swept back 45 degrees for better shock absorption and individually snubbed on rubber trunnion plates. The steerable nose strut is attached to the main fuselage beams and its wheel trails aft.

Extra-large Fowler flaps of 20 sq. ft. of area are used with the high-lift wing. The flaps are activated mechanically by a long pull-down lever which extends along the headliner forward. Stall with full flaps is 53 mph. and 64 mph. clean, with aileron control in the stall. Visibility from the front seats is excellent.

(Continued on page 52)

These Lockheed photos show interior of 120-cu. ft. cabin (left) with cargo being loaded through 15.75-sq. ft. cargo door. Hinged upward (below), door is 56 ins. wide and 42 ins. high. Two 7-in. "I" beams run length of cabin floor for heavy loads. Airplane below has un-supercharged engine.

60-90 HP. For Lightplane Turboprop



Here's 60-90-hp. turboprop engine for lightplanes which has been flown by the Rover Company as a by-product of its automobile turbines. Complete with propeller and all accessories, it weighs 235 lbs. Air intakes are on sides with exhaust at rear.

A BRITISH automobile manufacturer, the Rover Co., Ltd., of Solihull, England, has developed two compact little turboprop engines for lightplanes as by-products of its pioneer development of gas turbine engines for autos. Known as the Rover TP60 and TP90, they develop 60 and 90 cruising brake horsepower, respectively.

The 60-hp. Rover was demonstrated in flight on February 7, 1961, in England, mounted in a small single-seat aircraft. Rover says the little turbines can be installed as conversion power units for lightplanes without any major airframe modifications. They feature vibration-free operation, little maintenance and easy accessibility for service. They burn either kerosene or diesel fuel for economic operation.

The TP60 and TP90 have similar dimensions, measuring 30.1 inches in length and 27.5 inches in height and 20 inches wide. They weigh 235 lbs., including propeller and accessories. Both units are now undergoing development to meet airworthiness standards for licensing and will not be available for 12 to 18 months. Estimated price for limited-production engines is about $4,600 and would be less after quantity production is reached.

H. Gorden Munro, president of Rover's North American subsidiary, issued descriptive facts for the engines. The 90-hp. engine is rated at 120 brake horsepower for take-off and 90 bhp. for maximum cruise, at 47,000 rpm. and 46,000 rpm., respectively, with a reduction gearbox providing a propeller shaft speed of 2,525 rpm. Munro listed fuel consumption at 1.38 lbs. per bhp. hour, which is more than double the fuel consumption of a 90-hp. piston engine. The Rover has a single-stage centrifugal compressor, one reverse-flow combustion chamber, single-stage axial-flow turbine and mechanical-type control system with automatic overpower and high temperature controls. The compressor has a pressure ratio of 2.8 to 1 and an air mass flow of 1.88 lbs. per second at 46,000 rpm. The turbine wheel's maximum exhaust temperature is 1,202 degrees F. Standard accessories include 12-volt starting system, generator, oil cooler, variable-speed throttle control, tachometer, jet pipe temperature indicator, variable-pitch propeller, spinner and backplate, ammeter and oil pres-

(Continued on page 57)

World's smallest propjet airplane is this ancient British Currie Wot, in which the Rover turbine was demonstrated last month. Originally built in the early 1930's, the Currie was powered by a 36-hp. Aeronca engine, topped 80 mph., cruised 65 mph. and landed at 40 mph., with 575-lb. gross weight, 405-lb. empty weight, wing loading of 4.1 lbs. per sq. ft., power loading of 16 lbs. per hp., wing area of 140 sq. ft., span of 22 ft. 1 inch, length of 18 ft. 2 ins. and height of 6 ft. 9 ins. Turboprop engine was fitted with no major change in the airframe.

Pacific Airmotive has delivered 12 corporate Allison Convairs, including this fleet of 7 operated by General Motors, shown on AiResearch Aviation Service ramp at Los Angeles International Airport.

Allison Convair Performance Report

AFTER delivering 12 Allison propjet Convair Conversions for corporate customers during the past year, Pacific Airmotive Corporation at Burbank reports the more powerful Super Convairs are not only outperforming the original piston-powered versions but are doing it at a lower fuel cost.

The report is based on flight data provided by Jim Stevenson, chief pilot for Union Oil Company of California, which is operating two of the conversions. The conversion replaces R-2800 piston engines with Allison 501-D13D turbines driving Aeroproducts propellers. The Allison engine is rated at 3,750 equivalent shaft horsepower for take-off, 3,375 eshp. maximum continuous, 3,105 eshp. climb and 2,150 eshp. for 90% cruise at 20,000 ft. and at 350 mph. For this cruise condition, the engine's fuel consumption is 1,040 lbs. per hour (specific fuel consumption is 0.484 lbs. per eshp. per hour).

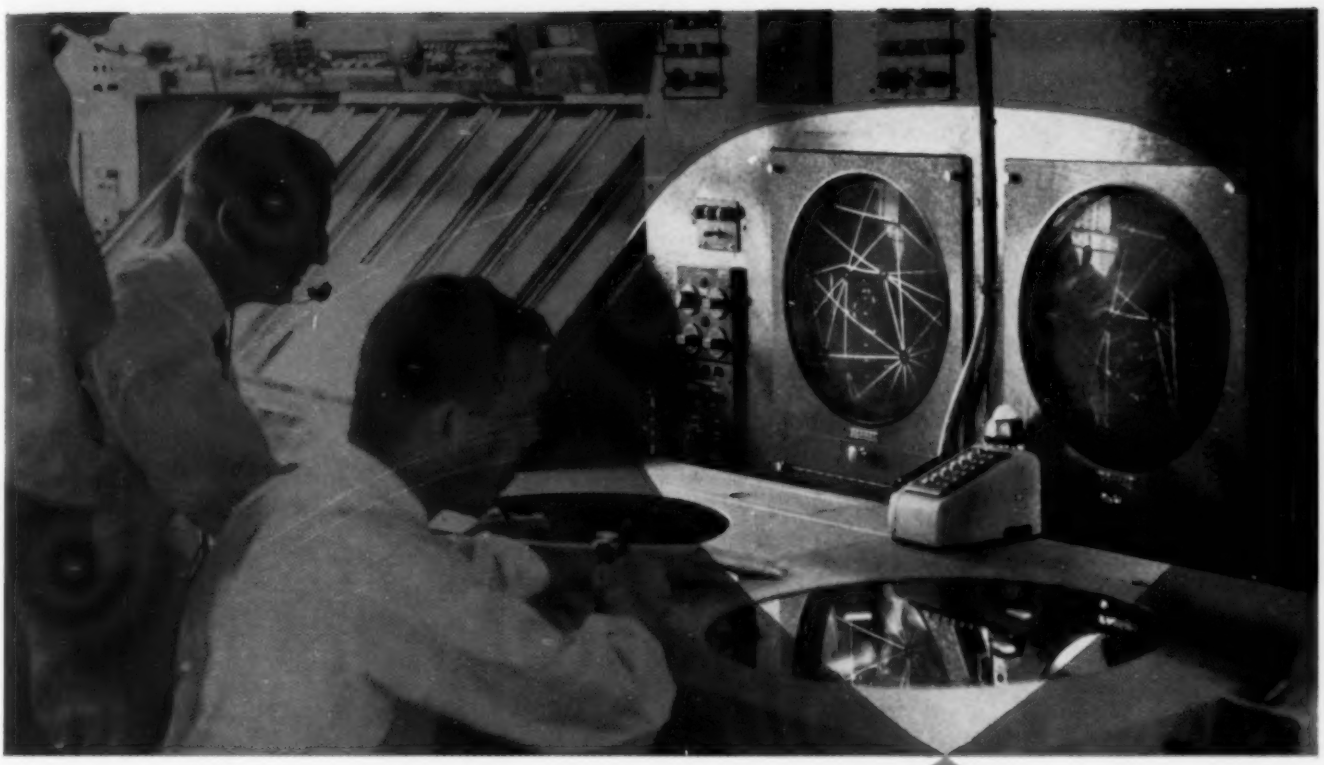
Stevenson's records show his Allison Convair makes a 2,500-mile flight in 2 hrs. 40 mins. less time than was required for the same trip in the piston-powered Convair with a fuel cost of 22.6 cents per mile in the Allison Convair as compared with 33.7 cents per mile in the standard airplane. A 1,400-mile trip took 4 hrs. in the Allison Convair at a fuel cost of 25.5 cents per mile compared with the standard Convair's time of 5 hrs. 30 mins. and fuel cost of 34 cents per mile for 115 octane fuel and 30.5 cents for 100 octane.

Stevenson says his Allison Convair requires a 3,000-ft. runway for take-off at 45,000-lb. gross weight at sea level on a standard day as compared to his standard Convair's requirement of 4,450 ft. He can land the Allison

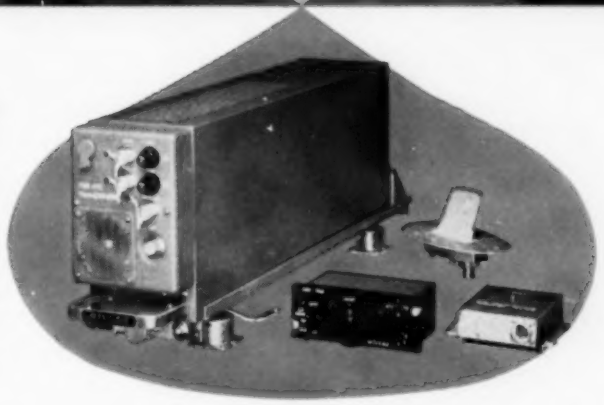
(Continued on page 57)

This corporate Allison Convair interior, designed and installed by Pacific Airmotive, features color tones ranging from warm beiges to chestnut brown.

Jim Stevenson, chief pilot for Union Oil, is shown at top of stairs boarding one of Union Oil's two Allison Convairs. With him are Harold H. Dice, Allison general manager, and John W. Myers (lower step), chairman of Pacific Airmotive, which converts Convairs to Allison power under Allison contract.



PERFECT COMBINATION
for positive identification
...the Unique Features and Unfailing Performance of the wilcox 714 ATC Transponder



It is a highly reliable Interrogator-Transponder System that provides: positive identification of aircraft under all conditions of weather or traffic . . . facilities for air-to-ground transmission of coded traffic control information. Its compactness and low power requirements make it ideal for use aboard business or commercial aircraft, including the smaller business twins.

Check These Features You Can Count on in the wilcox Model 714 ATC Transponder

- Contains Sidelobe Suppression System which eliminates undesirable replies to sidelobe emissions from the antenna of the ground control interrogator. The dual version of the Model 714 ATC Transponder operates on the 3 and 2 pulse systems, enabling you to use it world-wide. It is also available for domestic use in a 3 pulse only version at considerably less cost.
- Cavity tuned transmitter increases frequency accuracy . . . provides maximum stability.
- Provides positive identification and positive information.
- Contains provisions for automatic altitude reporting.

The wilcox Model 758 Transponder Function Tester

- provides positive indication of a reply to ground interrogation when the panel-mounted indicator light glows.
- provides instantaneous functional checking of operating condition either in flight or on the ground. Pilot simply activates a panel-mounted selector switch . . . when indicator light glows, he knows transponder is functioning.
- weighs less than 1 pound complete!

Count on the Transponder Chosen by these Leading Airlines

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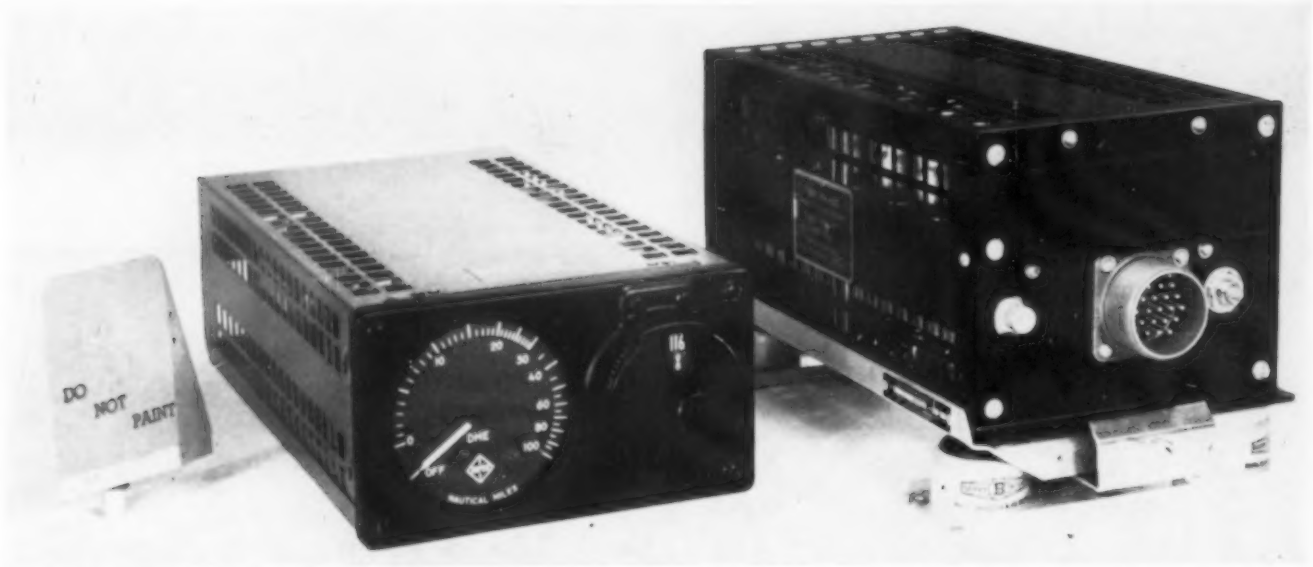


New Narco UDI-2 DME consists of standard Narco "Mark-size" panel-mounted control unit (center), remotely-installed power supply (right) and small broad-band blade antenna (left), which protrudes only 3 ins. Total weight is 14 lbs. Price is $2,250.

Poor-Man's DME For Lightplanes

LIGHTWEIGHT and low-priced for lightplanes and business aircraft, a new Narco UDI-2 DME will become available on the market in April to make automatic distance measuring available to the private owner as well as the airlines and military. It weighs 14 lbs., which is less than half the weight of previously-available but expensive DME's, including Narco's own UDI-1, is priced at $2,250 and its panel-mounted control-indicator unit is small to match the "Mark-size" dimensions of other Narco panel units.

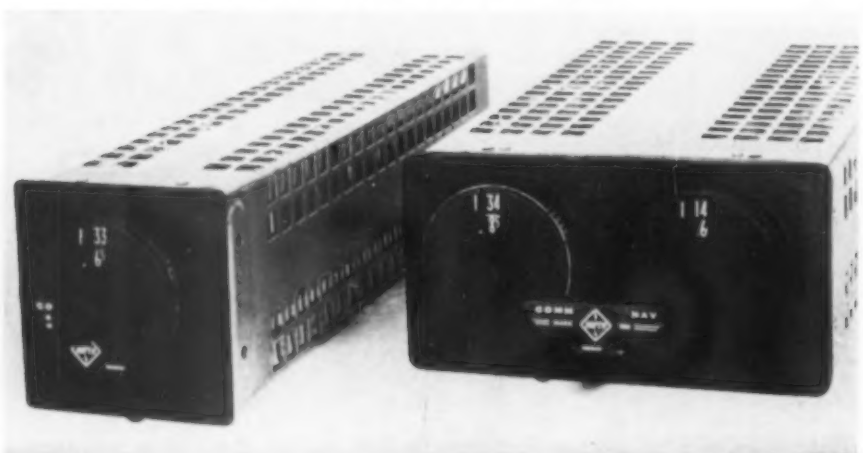
Developed from Narco's research work on a "poor-man's" DME under a contract with the Federal Aviation Agency, the unit continuously tells the pilot how many miles he is from a Vortac ground station or, in some installations, from the touchdown point on an instrument landing runway. Its indicator dial covers the scale from zero to 100 nautical miles. At least 344 Vortac stations are in operation and they will be increased to total 883 stations by 1966.

With accurate mileage and relative bearing to a station by means of Vortac and DME, the pilot knows his exact position continuously without estimating and calculating. This omni and DME combination provides an infinite number of fixes and intersections for traffic control and thus makes possible new and simplified holding and instrument approach procedures including orbital approaches to smaller outlying airports and FAA is already approving DME approach procedures to many facilities. Approaches are expedited with knowledge of exact position from a fix while inbound — it eliminates the need for coming in over the fix at cruising altitude before starting let-down outbound and reversing course with a procedure turn before final approach. Estimates of time of arrival over en route fixes are easier and more accurate because DME permits easy and accurate ground speed determination.

The Narco DME is crystal-controlled in the same manner as a late model omni receiver and has 100 channels (108-117.9 mc). To simplify tuning and eliminate confusion, the same "numbers" are used in tuning to the DME as to the VOR facility of the station being used. For example, if the VOR station is 111.8 mc, both the VOR and the DME frequency

(Continued on page 56)

TWO NEW AIRCRAFT RADIOS were also announced by Narco last month. Narco Mark 7 (left) mounts in standard instrument cut-out, provides two-way VHF communications on 360 channels with 50-kc spacing between 118.00 and 135.95 mc. It weighs 10.5 lbs., costs $1,195, uses one frequency selector for both transmitting and receiving. Also new is Mark 10 (right), which combines 360-channel transceiver, similar to Mark 7, plus a separate 190-channel crystal-controlled receiver (right-hand control head) which can be used for VOR and ILS/LOC signals plus voice communications up to 126.9 mc. Coupled with a Narco VOR-3A omni converter the Mark 10 provides basic comm-nav package around which a full 2½ IFR system can be built. Mark 10 weighs 12.5 lbs., costs $1,695.



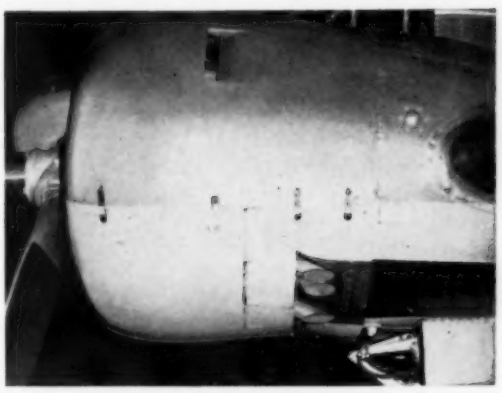
An Oasis...

for those who want the best in modification service

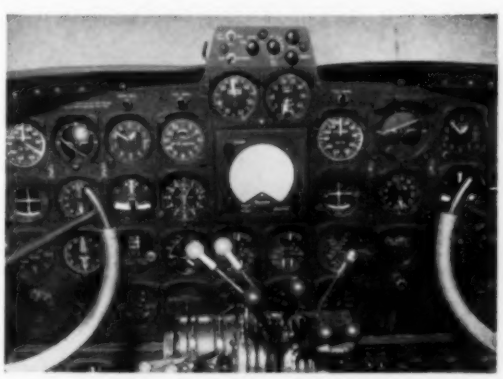
...that's OHIO AVIATION

All Beechcraft Modification Services Available

For many years Ohio Aviation has had the reputation for supplying comprehensive modernization and modification services to private and business plane owners. Recently added—a number of Beechcraft approved and engineered modifications that provide better appearance and increased performance. Here are a few of the modification and modernization services available at Ohio Aviation. We will welcome the opportunity to discuss them with you. For information write or call Charles Groff or James Speer at Ohio Aviation—TW 8-4646.



Super 18 Short Exhaust Stacks—reduce vibration, and eliminates back pressure.

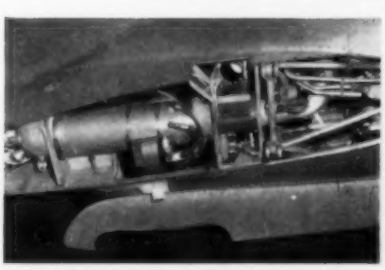


Complete testing and maintenance for all types of radar. Service by factory trained technicians.

THE OHIO AVIATION CO.
Dayton Municipal Airport
VANDALIA, OHIO

Super 18 landing gear doors. Encloses wheels. Reduces drag in flight.

Utility Cabinet. Drink and Snack bar complete with thermos holder, glass, rack, ice provisions, etc.



50,000 BTU Heaters—airline surface combustion type. Comfortable heat year around.

Glassed aircraft showroom was crowded with opening-night visitors at Van Nuys Skyways. Finley Brinley, president, monitors ramp activity with closed-circuit TV (left).
—(Cessna Photos.)

Model Cessna Sales-Service Center

A MILLION-DOLLAR business-flying sales and service center was opened with Hollywood showmanship last month by Van Nuys Skyways, Cessna dealership in the Los Angeles area. Visitors saw numerous distinctive features which make the new facility a nationally-outstanding and model sales and service center. It incorporates ideas formulated by Finley Brinley, president of Van Nuys Skyways, in partnership with Walter Von Der Ahe, grocery chain executive. Brinley was formerly in auto, frozen foods and real estate sales.

"When we bring in a prospect for an airplane, we'll have it in stock for him, including choice of paint jobs," says Brinley in reference to his policy of stocking a variety of Cessna models ranging in price from $8,000 to $95,000.

Visitors also find themselves swamped with service — while an electric cart meets the arriving plane to carry its occupants to the modern lounge, ramp men vacuum the plane's cabin. Fuel trucks also carry free ice for the plane's refreshment box, complimentary hand towels and hot-start battery power, in addition to gasoline, oil and turbine fuel. Flying businessmen are furnished meeting rooms for conferences and two roomettes are available, with couch, desk and private bath for a stay of a few hours or overnight. The 24-hour facility has its own restaurant, ground-school classroom, FAA office and lounge, as well as flight office with weather teletype, sales offices, parts department, complete servicing shops, large aircraft show room, storage hangars and 14-acre paved ramp.

Roomettes with private bath are on the Skyways ramp, as are meeting rooms for flying businessmen (below, left) and restaurant. Fuel truck carries free ice, hand towels, vacuum cleaner, hot-start battery power.
—(Cessna Photos.)

RIVIERA BY LANE

A brilliant and beautiful Italian design... executed in the fine European tradition with absolute attention to each detail. Fitted with reliable American instruments and radios... Continental engines... for finest, most consistent performance.

The Riviera is a luxurious, roomy 4-place, all-metal aircraft with a cruising speed of over 165 m.p.h. and a top speed of 182 m.p.h. It is the first amphibious aircraft ever offered which gives the top performance characteristics of a land based plane.

Soon the Lane Riviera will be in various parts of the country for dealer demonstrations. If you would like to see it... or better yet, fly it... contact: **Gerald L. Spear, Executive Vice-President, Lane Aircraft Company, 715 Exchange Bank Building, Dallas, Texas.**

informational report #1 now available

LANE
AIRCRAFT COMPANY · DALLAS, TEXAS

Speakers at the Flight Safety Foundation's Sixth Annual Business Aircraft Safety Seminar included Jerome Lederer (left), FSF managing director; Frank (Gerry) Andrews (center), head of the University of Southern California's Aviation Safety Division, and E. Tilson Peabody (right), director of air transportation for General Motors.

—(Bauer Photos by Bill Truelove.)

Accident Prevention For Air Safety

AIRCRAFT accident investigation has been developed to a remarkable degree of perfection but aviation safety will always be lacking until every individual and organization engaged in aviation recognizes and works for accident prevention in aircraft operations. Basic steps for the furtherance of accident prevention were discussed last month at the Sixth Annual Business Aircraft Safety Seminar conducted in Dallas by the Flight Safety Foundation, Inc., the nation's leading non-profit institution dedicated to safer flying. The two-day forum was attended by over 100 participants, most of them pilots and crew members of corporate aircraft engaged in business flying.

Jerome Lederer, managing director of Flight Safety Foundation, keynoted the need for all-out accident prevention and proposed intensive quality control or safety-conscious monitoring of all segments of aviation — by individuals and firms engaged in or in support of flight operations and by the Federal Aviation Agency.

"There are many kinds and forms of quality controls," said Lederer. "One of the most important in flight operations is incident reporting of near misses and faulty navigation signals. But incident reporting was discontinued because pilots were caused to fear reprisal in FAA violation charges. I believe incident reporting should be resumed and with impunity to pilots reporting incidents. At the time it was discontinued, three near misses a day were being reported. These are serious safety hazards and they can not be ignored except at the risk of life and property loss."

(Continued on page 50)

Ansel E. Talbert, Flight Safety Foundation vice president and executive editor, outlined the Foundation's projects at the seminar. FSF staff members conducting the seminar are shown below. Left to right are Joe Chase, maintenance and equipment director; Al Miner, flight operations director and Carl Schmidt, engineering director.

—(Bauer Photos by Bill Truelove.)

OVER 6,000 NARCO MARK V's

more than all other "new generation" vhf comm/nav units combined!

So popular and so useful and so satisfactory is the Narco Mark V that it has outsold all of the other "new generation" lightweight, crystal-controlled VHF communications units combined. Offered as factory-installed equipment by every business aircraft manufacturer, the Narco Mark V has been so thoroughly improved and perfected that it is by far the best buy when you're looking for full channel capability for years to come.*

The Narco Mark V gives you 90 transmitting channels (118 – 126.9 mc), 190 crystal-controlled receiving channels (108 – 126.9 mc) covering *both* communications *and* navigation frequencies. Separate control heads permit completely flexible operation and use of the receiver section for VOR and ILS/LOC navigation with the Narco VOA-3A omni converter attached.

*Recently revised FAA "Frequency Deployment Plan" eliminates proposed requirement for TSO equipment for IFR and assures satisfactory IFR operation below 24,000' until at least 1966 for aircraft equipped with communications units having 100 kc spacing and frequencies below 127 mc.

narco

NATIONAL AERONAUTICAL CORP., FORT WASHINGTON, PA.

HERE'S THE SIGN OF THE FINEST SERVICE FOR YOUR PIPER AIRPLANE

Piper has established a world-wide network of Factory-Certified Service Centers to assure you of the finest service possible for your Piper airplane.
To earn the coveted designation, service organizations must meet rigid requirements, must be properly equipped and staffed by personnel who have attended the intensive service school conducted at the Piper plant.
Dozens of Piper Factory-Certified Service Centers have been established throughout the nation and around the world, and more are being designated to assure convenient and competent Piper service wherever you may wish to fly.

FOR THE BEST IN PIPER SERVICE AND MAINTENANCE VISIT THE PIPER FACTORY-CERTIFIED SERVICE CENTERS LISTED BELOW

ANDERSON AVIATION CO., INC.
Sky Harbor Airport
P. O. Box 5175
BRidge 5-5741
Phoenix, Arizona

BROWNING AERIAL SERVICE
Municipal Airport
P. O. Box 1173
HOmestead 5-1728
Austin, Texas

CATLIN AVIATION CO.
Will Rogers Field
P. O. Box 2398
MUtual 5-6644
Oklahoma City, Oklahoma

CUMMINGS & GROVES AVIATION, INC.
Houston International Airport, Hangar No. 8
MIssion 4-5593 *and OLive* 4-4351
Houston, Texas

DELAWARE AVIATION CORPORATION
North Philadelphia Airport
HObart 4-1600, *TWX PH* 520
Philadelphia 36, Pennsylvania

EXECUTIVE AIRMOTIVE, INCORPORATED
Stewart Air Park
P. O. Box 70
GArfield 8-3581, *GArfield* 2-7277
Parkersburg, West Virginia

J & J AIRCRAFT, INC.
Sarasota-Bradenton Airport
821 *General Arnold Road*
ELgin 5-6868
Sarasota, Florida

KEN-MAR AIRPARK, INC.
Ken-Mar Airpark
Box 2667, *University Station*
MUrray 3-6589
Wichita, Kansas

RED AIRCRAFT SERVICE, INC.
Broward County International Airport, Building 78
JAckson 3-9624
Fort Lauderdale, Florida

ROSS AVIATION, INC.
Riverside Airport
HIckory 6-6654
Tulsa, Oklahoma

WITH THE

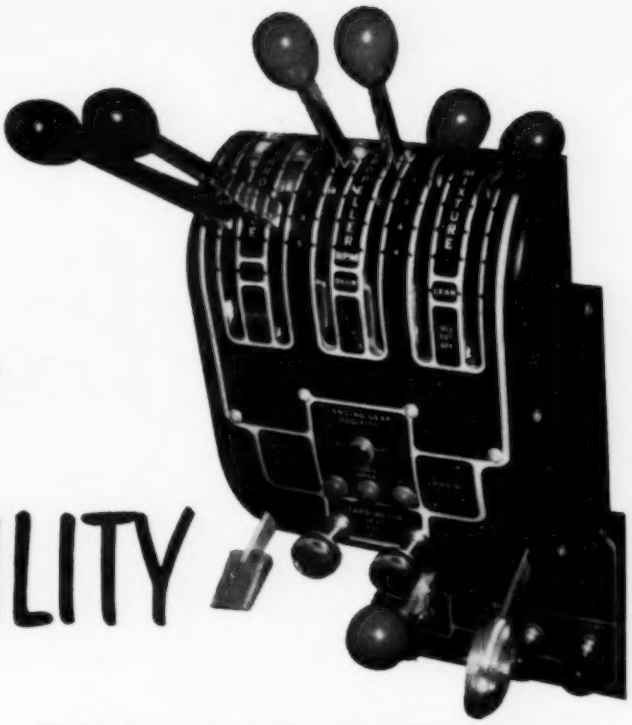
PIPER

Apache

TWO OF EVERYTHING*

MEANS

TWICE THE UTILITY



Ease forward the throttles of the newest Apache G and you know there's authority behind the smooth, quiet twin Lycomings. And while the surge of 320 horsepower is more than you may be accustomed to ... even in high performance, single-engine airplanes ... you'll be surprised at the ease and simplicity of flying the Apache. Any myth that twin-engine flying is complicated is quickly disproved. You'll feel surprisingly at home from your very first take-off and landing. Only sensible dual practice in engine-out procedures makes twin-engine transition a little lengthier than any other check-out.

Then watch your utility grow when you're flying your own Apache. Night-time becomes preferred flight-time. Sun-down ceases to be a bother; no longer does your engine go into "automatic rough" when you're on instruments or crossing water.

WHY NOT CONSIDER STEPPING UP TO AN APACHE?

You'll fall in love with its nice flying characteristics. Your passengers will enjoy a new degree of cabin roominess, quietness and comfort. And you'll find the Apache unmatched for dependability and freedom from maintenance—so thoroughly has it been proved and improved.

A comparison between initial and operating costs of the Apache—with its economical Lycomings—and your present single-engine plane will surprise you pleasantly. And your increased utilization—and lower insurance—will have a healthy effect on over-all per mile costs.

Think it over. Isn't now the time for you to go twin ... and isn't the Apache the twin for you? It's completely in a price class by itself.

Check-fly the Apache G with your Piper dealer or write for new Apache G brochure, Dept. F-3.

PIPER AIRCRAFT CORPORATION
Lock Haven, Pa.

** Dual generators, dual vacuum pumps, dual fuel pumps standard on Custom model, too. New beautiful Apache G carries 4 or 5, cruises 171 mph. Standard price $37,990.*

THIRD FLIGHT TRAINING CENTER authorized by FAA to graduate students as certified private pilots without FAA check rides is United Airplane Sales' flight school at Wichita, Kans. Jack Dixon, shown with Student Grant Stannard and Beech Travel Air, said his school has graduated 500 students with 100 students currently under instruction.

AIR REPORT

(Continued from page 8)

last month. It is applicable to aircraft operating IFR in controlled airspace and pilots must report immediately to FAA Air Traffic Control (1) loss of omni, Tacan, ADF or low-frequency navigation receiver capability, or (2) complete or partial loss of ILS receiver capability, or (3) impairment of air-ground communications capability.

NEW PRESIDENT OF FAIRCHILD ENGINE & AIRPLANE CORP., Hagerstown, Maryland, is Edward G. Uhl, until recently vice president and San Diego Division manager of Ryan Aeronautical Co. Sherman Fairchild said the 43-year-old Uhl "completes the new and younger general managerial team the company needed for solving top technical challenges."

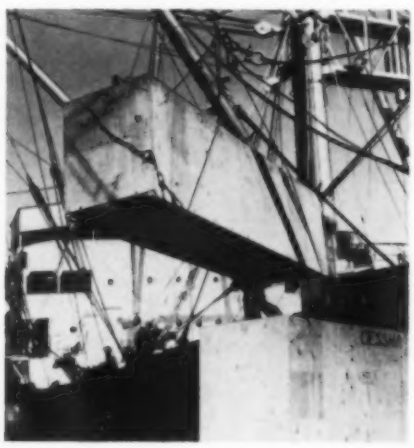
CESSNA AIRCRAFT'S EXPORT SALES in excess of $12.6 million during 1960 hit an all-time high and Export Sales Manager Mel Mellinger said another good export year is expected with new areas lifting import restrictions, especially in Australia, New Zealand and some areas of Africa. Cessna exports went to 107 Cessna sales outlets in 66 foreign countries. New sales outlets were opened during the year in the Union of South Africa, Angola, Ghana, Sudan, Israel, Lebanon, Korea, Saudi Arabia, Turkey, Brazil, Ecuador, Jamaica, Argentina, Finland, Portugal, Denmark, Holland and Italy and Cessna's British distributor, Airwork Services, Ltd., plans to expand its sales organization.

NEW BEECH BARON TWIN will make a March-April-May demonstration tour through 12 nations — Greece, Turkey, Lebanon, Iran, Pakistan, India, Ceylon, Burma, Malaya, the Philippines, Australia and New Zealand. Mike Neuberger, Beech vice president-export sales, said Alex Kvassay and Leo Sander will fly the Baron from Wichita to Greece to start the tour there, with Beech distributor-dealers in charge of local arrangements at all stops.

CESSNA MODEL 185 SKYWAGON, 6-place, 260-hp. workplane with 172-mph. top speed, was issued an FAA aircraft type certificate last month.

NEW CHAIRMAN OF THE GENERAL AVIATION COUNCIL is Dr. William Requarth of Decatur, Ill., president of the National Pilots Association. He succeeds H. B. Wetherell of Hartford, Conn. Joseph T. Geuting,

LARGEST SINGLE SHIPMENT OF BUSINESS AIRCRAFT EXPORTED FROM U. S. was 37 Cessna's boated to Rex Aviation, Ltd., Bankstown, Australia, last month. Alex Simpson, Rex manager, and Ev Schoenberg, Cessna's export sales administrator, are shown below while other photo shows one of the crated Cessnas going aboard ship. All single-engine Cessna models made up the half-million-dollar shipment. They were flown to New Orleans and crated there.



let your Mooney dealer explain why Mooney is the buy!

See your Mooney distributor or dealer now.

ARIZONA
Phoenix—Arizona Mooney Sales, Inc.
ARKANSAS
Little Rock—Armiston Aviation Assoc.
CALIFORNIA
Anaheim—ORCO Aviation, Inc.
Auburn—Placer Flying Service
Bakersfield—Aero Mooney Aviation, Inc.
Fresno—Aircraft Enterprises
Hayward—Western Aircraft & Engine Co.
Long Beach—Corporate Aircraft Assoc.
Santa Paula—Bassett Flying Service
Santee—Santee Air, Inc.
COLORADO
Longmont—Mile Hi Mooney, Inc.
CONNECTICUT
Darien—Conn Mooney Sales
FLORIDA
Leesburg—Air South, Inc.
Miami—Great Southern Aircraft Corp.
ILLINOIS
Carmi—Bill Harmon
Lombard—Mitchell Mooney Sales
Moline—Moline Flying Service
Olney—Bob McGregor
Paris—Paris Air Associates
Springfield—Capitol Aviation, Inc.
IOWA
Creston—United Flying Service
Fort Madison—Bullard Trailer Sales
Sioux City—Airways Service, Inc.
KANSAS
Kansas City—Aviation Enterprises
Wichita—Flournoy Flying Service
LOUISIANA
Monroe—North Louisiana Aero
MARYLAND
Easton—Universal Aviation
MASSACHUSETTS
Marshfield—Marshfield Airways, Inc.
MICHIGAN
Detroit—Skylark Flying Service, Inc.
MINNESOTA
Fertile—Walters Aviation
Hopkins—Executive Aero, Inc.
Minneapolis—Ford Aviation, Inc.
Willmar—Willmar Air Service, Inc.
NEVADA
Las Vegas—Nevada Aircraft, Inc.
NEW JERSEY
Teterboro—Watson Aviation, Inc.
NORTH CAROLINA
Charlotte—Smith Regal Flying Service
Rocky Mount—Harmon Mooney Sales
NORTH DAKOTA
Hettinger—Hettinger Air Service
Minot—Pietsch Flying Service
Rugby—Crawford Aircraft Sales
OHIO
Canton—Al Holmes Aircraft Radio Ser.
Columbus—Air Ohio, Inc.
Dayton—Car Imports of Dayton
Galloway—Columbus Airpark, Inc.
OKLAHOMA
Enid—Shuman Flying Service
Sayre—Gerald Bibb
Tulsa—Aircraft Management Co.
OREGON
Albany—Cascade Aviation
Brookings—Western Aero, Inc.
Grants Pass—H. F. Shaw
PENNSYLVANIA
Lancaster—Garden Spot Airpark, Inc.
McDonald—Campbell Air Service
SOUTH CAROLINA
Greenville—American Aviation Service
TEXAS
Brownsville—Sam Hughston
Corpus Christi—International Aviation
Dallas—Mustang Aviation, Inc.
Electra—Parks Mooney Sales
El Paso—El Paso Mooney Sales
Friendswood—Winsett Aviation
Houston—Bridge Aviation, Inc.
Midland—West Texas Flying Service
UTAH
Ogden—Aircraft Sales Company
Salt Lake City—Kemp & Kelsey
WASHINGTON
Omak—Omak Aircraft Sales
Renton—Executiveair, Inc.
Shelton—Aerolympic Company
Spanaway—Tacoma Flying Service
WASHINGTON D.C.
Cardinal Aviation
CANADA
Alberta
Calgary—Mike Hackman
Edmonton—McKnight Aviation
British Columbia
Kamloops—Bill Hetrick
Prince George—Caribou Wings
Quesnel—John Harvey
Vancouver—Western Aeromotive
Ontario
Mt. Hope—Genaire Limited
London—Execaire Limited
Toronto—Vandare Limited

MOONEY AIRCRAFT, Inc.
Kerrville, Texas

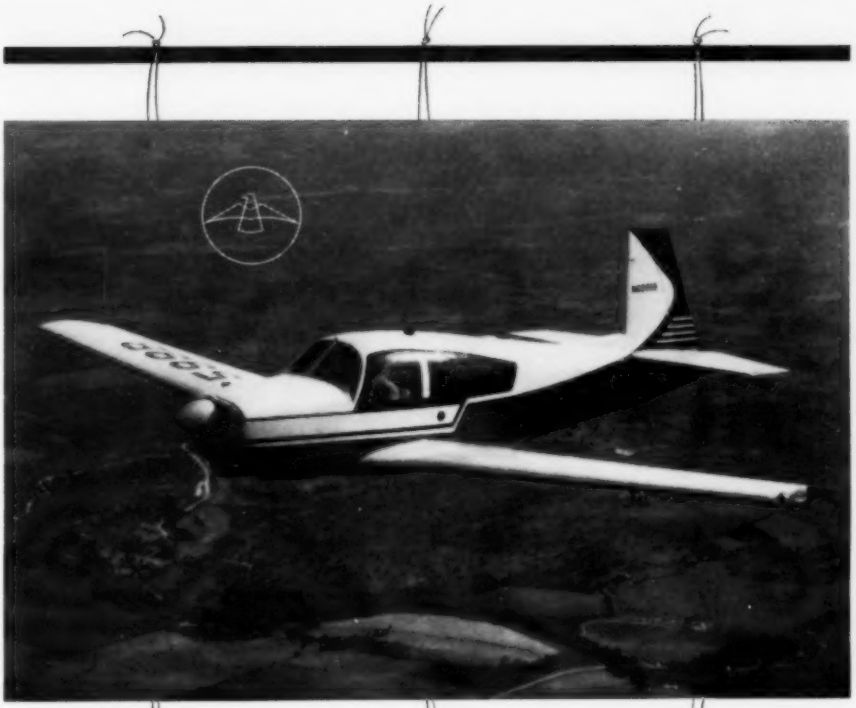
Jr., maanger of the Utility Airplane Council of the AIA, was re-elected secretary-treasurer. Elected members of the executive committee of the GAC are: G. F. Quinby, Narco vice president representing ADMA; J. Henry Stuart, manager of Addison Airport at Dallas representing NATA; B. J. Bergesen, Ford Motor aviation manager and representing NBAA, and Mr. Wetherell and Dr. Requarth.

ATLANTIC AVIATION CORP., headquartered at Wilmington, Delaware, and pioneer fixed-base sales-service firm founded in 1927, reported 1960 sales of more than $16 million excluding brokerage sales of 14 million-dollar Grumman Gulfstreams. It is the world's largest business aircraft sales and service organization employing about 500 persons at 6 facilities on the East Coast and at a London office. Stewart E. Poole, who has been with the firm since it was founded by Henry B. duPont, was promoted recently from president to board chairman and Watson E. Richards, executive vice president, was promoted to president.

PRICE CUT FOR AERO COMMANDER MODEL 500A from $75,000 to $67,500 was listed last month.

CARL WOOTTEN is now sales manager of Downer Aircraft Industries, Alexandria, Minnesota, manufacturers of the 200-mph., 260-hp. 4-place Bellanca. . . . **EAST COAST FLYING SERVICE,** Martinsburg, West Virginia, is new Cessna sales-service distributor.

NEW LEAR TROPHY for achievement in air traffic safety, established last month for first presentation next year, is pictured below with William P. Lear (left), chairman of Lear, Inc., and Maj. Gen. David Wade, commander of the First Missile Division at Vandenberg Air Force Base. Trophy launching commemorates 30th anniversary of Lear, Inc.



initial cost $15,995.

hourly operating cost $10.71

time costs $$$

when buying an airplane consider all the costs

Total cost of flying a Mooney Mark 21 in five years can save you up to $13,350.00 over the total cost of flying a Cessna 210. The Mark 21 will save you as much as $17,885.00 over a 250 Comanche . . . will save you up to $16,930.00 over a Debonair.

These are three examples of how MOONEY can save you as much as its original purchase price in five years of operation (comparisons are based on 300 hours per year and use manufacturers published figures.)

Initial Cost, Operating Cost, and Time Cost must be considered as a "Total Cost" in determining comparative cost of air transportation.

Compare "Total Costs" with any single engine business plane flying . . . dollar for dollar — feature for feature the all new, all metal Mooney Mark 21 adds up to the best investment in modern transportation.

anyway you figure it... Mooney is the buy!

MOONEY COMPARISON FILE

You're invited to make your own comparison check. Profit from your flying, write for the MOONEY COMPARISON FILE or see your Mooney dealer today.

MOONEY AIRCRAFT, INC. · KERRVILLE, TEXAS

Cavalier 2000

Mustang Conversion

Trans-Florida Aviation, Inc., Data

Powered by Rolls Royce-Packard Merlin 1650-7 rated at 1,490 hp. for Take-off and 1,180 hp. METO

Price			**$32,500**
No. Seats			**2**
Gross Wt., lbs.			**10,500**
Empty Wt., lbs.			**7,121**
Useful Load, lbs.			**3,379**
Useful Pct. of Gr. Wt., %			**29.5**
Fuel Cap., gals.			**376**
Oil Cap., gals.			**12.5**
Coolant Cap. gals.			**21.5**
Top Speed 30,000 ft., mph.			**457**
Stall Spd., gear and flaps down, mph.			**86**
Cruising Performance—	**Mph.**	**Alt., ft.**	**Gph.**
Max. Cruise (METO)	**424**	**30,000**	**94.0**
Normal Cruise	**370**	**25,000**	**74.0**
Normal Cruise	**326**	**15,000**	**65.0**
Economy Cruise	**316**	**20,000**	**54.3**
Economy Cruise	**260**	**10,000**	**43.4**
Maximum range, 2,000 miles			
Rate of Climb, fpm.			**2,550**
Service Ceiling, ft.			**40,000**
Take-off Dist. over 50-ft. Obstacle, ft.			**1,850**
Landing Dist. over 50-ft. Obstacle, ft.			**1,750**
Wing Area, sq. ft.			**272.3**
Wing Loading, lbs. sq. ft.			**38.5**
Power Loading, lbs. hp.			**7.0**

Span, 40.1 ft.; length, 32.2 ft.; height, 12.2 ft.

Cavalier For Flying Sportsmen

Seven sportsman pilots are now flying his P-51 conversions and D. B. Lindsay, Jr., believes many others will — he has new facilities for converting the 2-place, 424-mph. speedsters at Sarasota, Florida.

D. B. Lindsay, Jr., of the Sarasota, Florida, newspaper publishing business (Herald-Tribune and Journal), began developing a businessman's conversion of the North American P-51 Mustang five years ago. But every time he came up with a finished package, or prototype as the engineers would say, some enthusiast wanted one, too. Today, after 7 prototypes and 7 purchasers, Lindsay has decided there's potential market enough to justify production-line conversion of a certificated, commercial 2-place businessman's speedster. Trans-Florida Aviation, Inc., of which he is president, has a new facility and is marketing the conversion as the Cavalier 2000.

Lindsay's Cavalier offers the sporty businessman pilot a package of performance consisting of cruising speeds up to 424 mph., cruising range up to 2,000 miles and over-the-weather service ceilings up to 40,000 ft. For details, see the accompanying tabulation.

He has priced the fastest propeller airplane in the world at $32,000, completely equipped except for radio. It burns about 4 to 5 times as much fuel as a popular $25,000 four-place lightplane but is twice as fast and has almost twice the range and twice the ceiling.

The 2-place Cavalier is powered by a Rolls Royce-Packard Merlin 1650-7 liquid-cooled engine with two-speed, two-stage supercharger and rated at 1,490 hp. for take-off at sea level and 1,180 hp. maximum except take-off. This gives the Cavalier a power loading of only 7 lbs. per hp. at its 10,500-lb. gross weight. At this gross, its useful

(Continued on page 50)

Here's Trans-Florida Aviation's Cavalier 2000 demonstrator. Two more conversions are on the production line and the firm maintains a stock of airplanes, parts and service facilities. Cavalier is world's fastest propeller-driven businessman's airplane.

The TACTAIR T-3 is the only autopilot FAA-approved* for single-engine operation in twin-engine business planes.

It also is the only one that gives you
smooth pneumatic operation,
puts no load whatsoever
on your electrical system.
It does not clutch at the controls;
there are no clutches to strain.
And it's backed by factory field service representatives
and factory-trained, factory-approved service stations.
You'll get the best automatic flight
and the best service with Tactair in your twin.

*FAA-approved on these top twins
Beech Super 18
Beech Twin Bonanza
Beech Baron
Beech Travelair
Cessna 310
Piper Apache
(Approved for most popular single-engine business planes, too.)

TACTAIR
INCORPORATED
BRIDGEPORT, PENNSYLVANIA

AUTHORIZED
Cessna
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Symbol of the Man on the Go...

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Cavalier instrument panel includes complete navigation and communications layout. At pilot's right are circuit-breaker and switch panels. Leather-upholstered interior is shown below. At right is one of two baggage compartments in wing.

CAVALIER 2000

(Continued from page 46)

load is 3,379 lbs., which is sufficient for 2,528 lbs. of fuel (full tanks, 376 gals.), oil and coolant and 850 lbs. for 2 people (340 lbs.), and baggage and equipment (510 lbs.). Wing baggage compartments provide space for 400 lbs. of baggage and a radio compartment behind the rear seat has slide-out shelves for easy servicing.

W. P. Brownell of Trans-Florida says factory zero-time Merlin engines cost less than $3,000 each and similar power plant packages used by Trans-Canada Airlines operate over 1,000 hrs. between overhauls.

Brownell says the Cavalier takes off and lands over a 50-ft. obstacle within 1,850 ft. at sea level and 10,500-lb. gross weight. "We check out Twin-Beech pilots with ease — any capable pilot is extremely enthusiastic after flying this airplane," Brownell said.

He said the instrument panel provides for airline quality navigation and communication controls in front of the pilot, with provision for dual omni's with glideslope, RMI and omnimag presentations, ADF and 360-channel crystal-controled transceivers. Standard equipment includes Sperry H-6 electric non-tumbling gyro horizon and Sperry electric non-tumbling C-4 Gyrosyn compass. A custom canopy is tinted.

Features include two 96-gal. tip tanks with dual remote reading liquidometers, electric dump valves and individual electric fuel boost pumps; birdproof windshield, full trim on three axes, wide gear for easy ground handling, automatic engine heat controls with manual over-ride, lifetime wiring exceeding airline standards, comfortable leather-upholstered interior, super soundproofing, individually-controlled cabin heating and ventilation system, using heat from the radiator area instead of the manifold, and oxygen system with individual regulators.

Trans-Florida Aviation maintains complete parts and service facilities for the Cavalier.

ACCIDENT PREVENTION

(Continued from page 40)

A recognized authority on air safety, Lederer said the greater use of airborne flight recorders could bulwark accident prevention efforts. With 20 channels of information on a tape, improved aircraft and equipment maintenance could be charted, for the tape would reveal deviations from operational standards as well as deviation from good practices and computer analysis of the tapes on a routine basis would make possible corrective action as accident prevention.

"Scientific studies show that a factory worker might unknowingly perform 300 unsafe acts before just one of them results in an accident," Lederer said. "By detecting and correcting these unsafe acts soon enough, the accident can be prevented. This kind of prevention can be utilized in flight operations through the intelligent use of flight recorders."

Other forms of monitoring or quality control must also be exercised, Lederer said. While the Federal Aviation Agency is busy monitoring aviation, who monitors the FAA? Congress does, for one. But Lederer suggested the FAA consider a self-imposed monitoring to make certain it is accomplishing air safety with thoroughness. For example, the FAA might ask itself, perhaps through a committee type of study, why it discontinued incident reporting, why there is no quality control over its TSO's (technical service orders), why more DME's (distance measuring equipment) have not been installed and why quality control, as such, is not exercised more closely over certificated repair stations, over airways traffic control, over the design and manufacture of airplanes and their equipment, and over flight operations.

"The whole point is that quality control is effective and pays dividends in all forms of industry — it will do likewise in the furtherance of accident prevention in flight operations," Lederer said. "Public pressure for air safety is a form of quality control imposed on us. Responsible people and interests in aviation fear loss of business from air accident publicity and therefore strive for safety in flight. The inevitability, sureness and extreme success in accident investigation and hearings are a form of quality control which works for air safety — it is wiser to conduct safe operations and avoid the need for investigations than to become involved in accidents and the penalties they impose on the orderly development and acceptance of aviation."

Frank G. Andrews, widely experienced in aircraft accident investigation and now with the University of Southern California, which conducts courses in this new science, narrowed the need for accident prevention down to an individual basis for pilots and others engaged in business aircraft operations.

"About 80% of all general aviation accidents are caused by people, with hardware malfunction causing 18% and about 2% being in the undetermined category," Andrews said. "This means people — individuals — are the biggest key to accident prevention. People have accidents for many reasons. One is complacency — the average individual thinks accidents always happen to the other man and never to himself but he will never be

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safe until he realizes that he must personally prevent accidents without leaving it up to the other guy. Another reason is ignorance and lack of skill — you'll never be safe in an airplane until you have acquired intimate knowledge of the limitations of the man, your machine and the environment in which both operate. Yet we see men with enough sense to earn enough money to buy and equip a good airplane but not smart enough to take the time and the training necessary to know how to operate it safely. So he becomes a statistic and aviation suffers another blow."

He urged pilots to study their own operations for the purpose of preventing accidents, suggesting two useful methods. One is to conduct mock accident investigations, in which simulated accidents are analyzed to pinpoint causative factors. The other is to conduct accident prevention surveys of their own operations. "Experience in actual accident studies has proved to us that there are accident causative factors in almost any flight we want to analyze, whether it ended in an accident or not," Andrews said. "In actual accidents, these factors often cause us to wonder how the flight ever got as far as it did. If pilots would seek out these causatives by analyzing their own flights as a kind of safety follow-up, they could take corrective action before an accident happens rather than after it is too late for prevention."

LOCKHEED-AZCARATE

(Continued from page 32)

At 9,500 ft., with outside air temperature of 0 degrees C., indicated air speed was 121 mph. and true air speed 140 mph. using 2,400 rpm. and 27 ins. of manifold pressure. With the injection engine's fuel pressure indicator showing 8 lbs. per sq. in., fuel consumption for this setting is 14.3 gals. per hour. Glenn Gray, a Lockheed test pilot, carried a list of recommended power settings for the TSIO engine. Here it is:

Take-off — 2,600 rpm., 35 ins., 16.5 psi., 22.9 gph.

Climb — 2,500 rpm., 35 ins., 10.5 psi., 17.17 gph.

Cruise — 2,400 rpm., 27 ins., 8 psi., 14.3 gph.

Cruise — 2,300 rpm., 26 ins., 7 psi., 13 gph.

Cruise — 2,200 rpm., 25 ins., 6 psi., 11.3 gph.

Cruise — 2,100 rpm., 24 ins., 5 psi., 8.25 gph.

Cruise — 2,000 rpm., 23 ins., 4 psi., 7.75 gph.

While the big pull-down lever for the flaps is great, Lockheed will want to improve the location of the elevator trim tab control wheel. It is too far forward and too low, causing the pilot to bend down to use it and thus lose all the forward visibility which was designed into the airplane. It ought to be back between the two pilot seats for use without any lowering of the head, eyes or shoulder.

But the big news about the LASA 60 is not its performance — this can be taken for granted with any successful bush airplane. What makes it outstanding is its big roomy cabin and its flexibility for hauling people or cargo. This airplane has a cabin which is 11 ft. 10 ins. long, 48 ins. wide and 50 ins. high, with a useful volume of 120 cu. ft. Moreover, it has a big 56-inch-wide cargo door opening on the right side in addition to its 25.5-inch passenger door on the left side. The floor is stressed for heavy loads, being supported by two 7-inch "I" beams running its entire length. The floor has heavy-duty tie-down fittings and is of sealed construction for cleaning with a water hose. Seats are track-mounted and there is room for 6 seats.

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New Business In The Hangar

Aircraft Electronics Association Ready to Extend Nationwide Service Policy for Equipment Installations

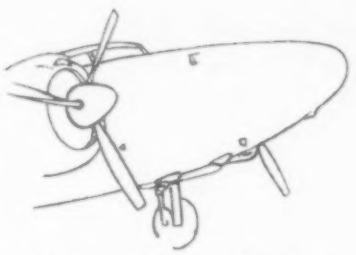
BELIEVED superior to any similar agreement yet devised, a new and different type of service policy is about to be inaugurated by member shops of the Aircraft Electronics Association. It assures the customer of any AEA member shop that his electronic equipment will be serviced by any other AEA member shop anywhere in the U. S. and Canada. Warranty service will also be covered so that the customer need not become involved in a struggle to obtain warranty service — it will be handled for him by the installing member shop and the member shop conducting the repairs.

D. R. Anderson of Anderson Aircraft Radio, Detroit, president of AEA, explained that each member shop will affix a special AEA decal to each major component it installs, the decal carrying a number and the date of the installation. In addition, the customer is given a complete list of AEA shops, giving their repair station ratings, if any, and listing the manufacturers they represent. Each AEA member has agreed to service installations carrying decals affixed by other members.

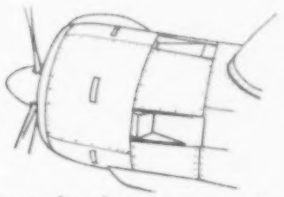
"Every pilot who has experienced electronic difficulties away from his home base is well aware how trying it is to find a competent repair facility," Anderson explained. "Usually it is simply caused by the shop being so busy with its local customers that he is forced to overlook the unfortunate transient. Under the AEA plan, however, each member has agreed to extend the same service and courtesies he offers his regular local customers. This service is only valid on installations actually performed by accredited members of the AEA. The AEA is constantly striving to upgrade the state of the art of electronics service, installation and improved equipment. Our proposed service policy is only one additional item which will assure our customers they will attain greater satisfaction and reliability from their electronic installations."

L. B. SMITH AIRCRAFT CORP., Miami International Airport, is conducting production test flights with its second production model of the pressurized Tempo II. It is scheduled for delivery in March to General Mills, Minneapolis, following tests in accordance with CAR 4b transport category procedures.

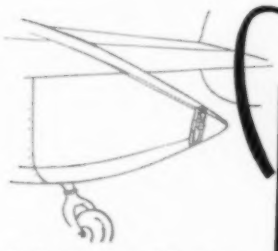
REMMERT-WERNER, Lambert Field, St. Louis, has one of Chemstrand's DC-3's, Bob Hinds and Ron Breckenridge, pilots, for 1,000-hr. inspection, new interior with Acrilan fabrics and carpet, new exterior paint job, new airstair, enlarged cabin windows, new radio and instrument panels, complete rewiring, installation of two Super-92 engines, Collins 51V glideslope and ARC-210. . . . M. L. Nicholson's Mine Safety Appliance DC-3 was in for a Bendix omni-mag and dual RMI, dual Sierracote windshields, new headliner and interior rework. . . . Warren Larson brought in Riss Truck Lines, Super-92 DC-3 for exterior repaint and fresh de-icer boots during annual inspection and engine change. . . . An ARC-21 ADF was installed in John Wilsdon's TransAire Aero Commander. . . . At RW's Pompano Beach shop in Florida, Fred Hotson and Andy Gabure had landing gear overhaul for their Ontario Paper Super-92 DC-3; fuel tanks were re-



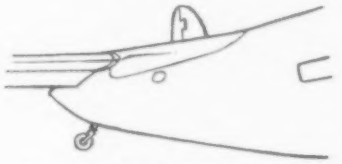
Radome and air speed system



Streamlined pressure cowling, improves performance.



Tail cone modification



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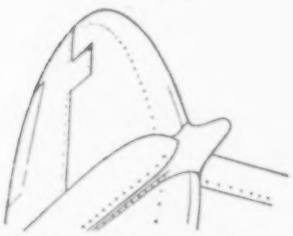

Note stabilizer short tips and fin stabilizer probe fairings

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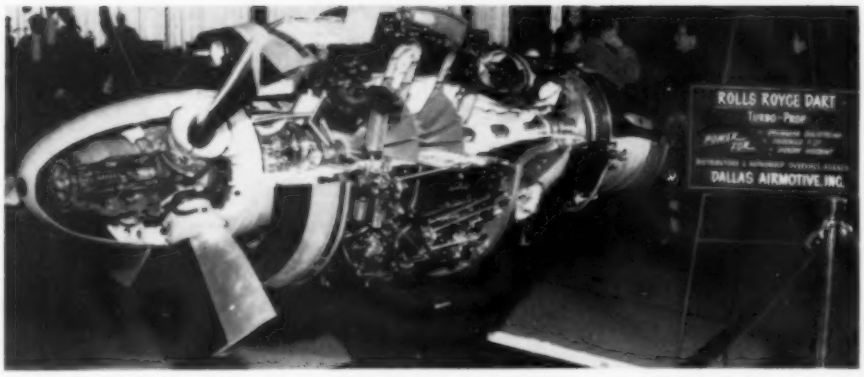
moved and overhauled for Pete LaFrambois and John Corrier and their Wolfe Industries DC-3, and Bill Thompson and Ambrose Urbany brought in their Jessop Steel Super-92 DC-3 for landing gear overhaul and engine change.

EXECUTIVE AIRCRAFT SERVICE, Redbird Airport, Dallas, performed exterior repaint and repairs on one of V. Irwin's Gulf Oil Gulfstars. . . . . Ben Duhon brought in E. W. Brown, Jr.'s DC-3 for right engine change and other work. . . . Ernie McGill's Bankers Life of Nebraska DC-3 was in for repairs.

READING AVIATION SERVICE, Municipal Airport, Reading, Pa., had Lou Hemmer's Armstrong Cork DC-3 for exterior repaint, double engine change, exchange of control surfaces and 4,000-hr. inspection of wings. . . . New interior, exterior paint job, 1,000-hr. inspection and engine change were performed on Steve Negoescu's Sharmex B-50 Twin-Bonanza. . . . Wells Forbes was in with Scott Paper's DC-3 for installation of ARC-210, dual ARC-21A ADF's and radio control panel mods. . . . In the hangar for work were Bob Carner's American Contract & Trust DC-3, a Southeast Airlines DC-3, the Princess Coal B-26, Musser Purchasing's Cessna 310, East Coast Aviation's Martin 404, Bill Austin's Lukens Steel Aero Commander, American Casualty's Aero Commander and the Bouse & Cronan Navion.



DALLAS AIRMOTIVE EXHIBITED CUTAWAY ROLLS-ROYCE DART PROP-JET engine at last month's Sixth Annual Business Aircraft Safety Seminar. Corporate and airline operators of Grumman Gulfstream, Fairchild F-27 and Viscount transports have contracted for overhaul of their Darts by Dallas Airmotive.

DALLAS AIRMOTIVE has announced construction of its Rolls-Royce Dart overhaul shop. Its Rolls-Royce service includes a rental program guaranteeing customers a replacement engine within 48 hrs. in event of an engine failure. The engine package is shipped as a complete quick-change unit with mount, accessories and auxiliary items to permit a 4-hr. engine change. Dallas Airmotive's test dynamometer, calibrated at take-off and cruise power and fitted with a propeller simulator, provides an engine ready to fly with minimum adjustment. Declaring these services are exclusive with Dallas Airmotive, the company says it is the only such program available for Dart-powered aircraft. Similar Rotol services are available for propeller and gear box.

MOHAWK AIRLINES' maintenance department, Oneida County Airport, Utica, N. Y., had Arthur Godfrey's Convair 440 for fuel-tank sealing. Frank Lavinia and Jim Meyers are the pilots. Scott Martin and Norman Snyder brought in their Eastern Gas & Fuel Convair 240 for tank sealing. . . . Mohawk has been named factory distributor for Collins Radio and factory dealer for ARC and will maintain a stock of Collins and ARC equipment.

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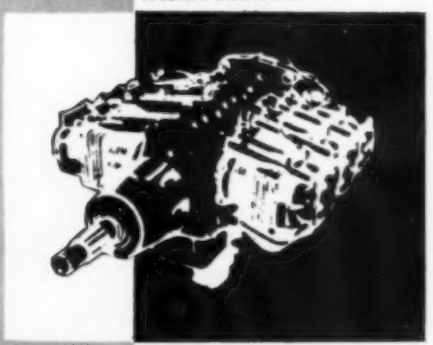

JOHN A. BAUMANN
General Manager

WILCOX ELECTRIC COMPANY, 1400 Chestnut St., Kansas City 27, has a new 44-page pocket-size booklet catalog picturing and describing its airborne and ground communication and navigation equipment, available on request.

AIRESEARCH AVIATION SERVICE, Los Angeles International Airport, delivered to Tony Zuma, aviation manager, and Lee Armstrong, chief pilot, Tennessee Gas Transmission's Viscount 800 after installation of complete custom interior, air conditioning modification, additional soundproofing, cockpit refurbishing, Collins Doppler radar installation, wing modification for larger slipper tanks and radio-electronics work. . . . Chief Pilot C. V. Steed and H. M. Mezick brought in Victor Adding Machine's Convair 440 for new aft-section interior, including stateroom and lavatory, interior and cockpit refurbishing, installation of Muzak tape reproducer and Sherwood hi-fi AM-FM tuner and radio-radar overhaul. . . . Also in the hangar were George Dippel and Jake Kindsvater with Timken Roller Bearing's B-25, Texaco's Convair 340, brought in by Steve Germick and Hank Searle, and Bill Brand's James S. Harrison Beech 18 from Ft. Lauderdale.

MATTITUCK AIRBASE CORP., Linden, N. J., installed dual fuel system in Wes Cornham's Hess, Inc. Lodestar. . . . Cliff Kernochan's E. Roland Harriman Grumman G44 had control surfaces recovered. . . . Walter Burd's Linden Flight Service de Havilland Beaver received major modifications and electronics installation. . . . Also in the hangar were Clarence Shelden's Flight Service Beech 18, Kurt Bohm's Beech; Otis Robins' Flight Service Beech 18, E. C. Wolford's Aero Commander and Frank Manno's Erwin Wasey Beech 18.

PACIFIC AIRMOTIVE, Burbank, delivered Broken Hill Proprietary Company's Australian-registered Grumman Gulfstream after installation of complete custom interior, oxygen system, new instrument panels with Glare-Ban lights, cabin instrument panel, smoke and fire detection system, and complete paint. . . . Gilberto Vallecillos brought in Banco Nacional de Credito's Aero Commander for double engine change and overhaul of landing gear, tanks, instruments and hydraulics. . . . Harry Conover and Bill Goodman brought in their Fluor Corp. Lodestar for wing removal and magnaflux, repaint and other work. . . . A Compania Mexicana de Aviacion DC-7 was in for conversion to CMA standards. . . . Arch McGregor's Mobil Oil DC-3 received cockpit window replacements and double engine change. . . . Rod Christensen has taken delivery of Stauffer Chemical's 21,500-lb. gross weight Lodestar after final flight test and firing of new JATO installation. . . . Esso Tanker's Convair is at PacAero for Allison propjet conversion. . . . PacAero delivered U. S. Steel's No. 3 and No. 4 Grumman Gulfstreams to Al Jones and Joe Bova.

HOWARD AERO SERVICE, International Airport, San Antonio, delivered Dick Prendergast's Chicago Tribune Mark II Super Ventura. . . . Sierracote heated windshield was installed for Harvey Glass in his Natural Gas Pipeline Aero Commander.

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POOR-MAN'S DME

(Continued from page 36)

selectors are set to 111.8 mc.

Actual distance is indicated to the pilot by means of a standard 3-in. dial with a range from 0 to 100 nautical miles. The 0-20-mile range is portrayed in larger scale for added accuracy and assistance in approaches.

Accuracy is in the order of .5 nautical mile or 2.5%, says Narco. The interrogator has also been designed to provide output for such future accessories as pictorial display or ground speed indicator as well as audio output for aural identification of the station's identifying code. The Narco DME operates on a "fail-safe" principal. If the airplane is too far from the station being interrogated, or is too low for clear reception, the range needle continues to "search" the dial, sweeping repeatedly from zero to 100 and back. Only when it has a positive indication of distance will it lock onto the station and begin counting off the miles.

James N. Riddle, president of Narco, announced the availability of the new equipment.

ELEVENTH ALL-WOMAN'S INTERNATIONAL AIR RACE has been set for May 27 from Lehigh Acres, Fla., to Nassau, with $2,500 prize fund. In charge are Lona Frame (left), president, and Mary Barrer, executive secretary of Florida Women's Pilots Association, Suite 508, First National Bank Building, Miami.

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ALLISON CONVAIR

(Continued from page 34)

onvair within 2,520 ft. after clearing 50-ft. obstacle.

Following are details of Stevenson's ,500-mile flights comparing his Alli- on Convair with his piston-powered onvair:

Elapsed Time: Propjet, 7 hrs. 15 ins.; piston, 9 hrs. 55 mins.

Average Ground Speed: Propjet, 345 mph.; piston, 255 mph.

Altitude Flown: Propjet, 22,500 ft.; piston, 19,000 ft.

Fuel Per Mile: Propjet kerosene, 5.4 lbs.; piston gasoline, 4.7 lbs.

Fuel Cost Per Mile: Propjet, 22.6 cents; piston, 33.7 cents.

For the 1,400-mile flight, the details are as follows:

Elapsed Time: Propjet, 4 hrs.; piston, 5 hrs. 30 mins.

Altitude Flown: Propjet, 20,000 ft.; piston, 19,000 ft.

Fuel Per Mile: Propjet, 6.1 lbs.; piston, 4.75 lbs. per mile.

Fuel Cost Per Mile: Propjet, 25.5 cents; piston, 34 cents.

LIGHTPLANE TURBOPROP

(Continued from page 33)

sure warning light. Oil consumption is 1/10th of a pint per hour.

An auto manufacturer since 1904, Rover began gas turbine research and development in 1940 in association with Sir Frank Whittle, inventor of the aircraft jet engine. From its early Whittle designs, the larger Rolls-Royce Nene and Derwent jet aircraft engines were developed, after which the company began developing small gas turbines suitable for automobiles. In 1950 Rover demonstrated the world's first turbine-powered auto. Rover has also developed small gas turbines for industrial and aircraft auxiliary power purposes. Currently in production are Rover gas turbine auxiliary power units for the Vulcan and Armstrong Whitworth 660-series aircraft. Other Rover turbines are marketed for a wide variety of industrial and commercial purposes, ranging from powering motor boats to auxiliary water pumps for fire fighting units.

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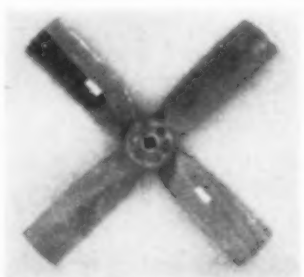

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